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ABSTRACT

This proposed 20-year plan for construction of facilities is based on analyses of (1) data related to the projected number and location of students in the district and (2) the adequacy of existing facilities. The study, a compilation of seven reports, begins with a description and the statements of adequacy for each school and its site. The next report provides recommendations regarding vertical grade organization -- the method of distribution and advancing students from grade to grade in either a graded, a multigraded, a nongraded, or a combined pattern. A 30-item bibliography concludes this report. A third report makes recommendations regarding the optimum school size for the district, and a 22-item bibliography is appended. The fourth and fifth reports are combined to analyze attendance areas and to discuss the immediate application of the data generated by the report on building and site inventory. In section six, which is devoted to a discussion of the cost impact of establishing kindergartens, detailed descriptions of five types of relocatable facilities are provided, as well as line drawings of each type. The last section discusses the longrange implications for attendance boundaries generated by the data on building and a site inventory and outlines an additional longrange plan for facility and use cost needs. (Author)

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MASTER PLAN FOR SCHOOL FACILITIES

North Clackamas School District No. 12

Milwaukie, Oregon

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PREFACE

Because of the numerous and complex components making up the contractual arrangement (to say nothing of the interrelations among the various components) between North Clackamas School District and the Bureau of Educational Research, the preface cites the working parts of the contract* as originally agreed upon. To insure completion of all items, the organization of the document herewith submitted follows the outline of the actual contract. That is, item 1.0 of the contract becomes Section 1 of the report, item 2.0 of the contract becomes Section 2 of the report, etc. In this way both parties will have ready reference to insure completeness of the assigned tasks.

Therefore what follows is the outline of the working parts of the original contract:

Section 1.0 Obtain basic information needed to develop a master plan for school and facility construction.

1.1 Using data obtained from maps, plot plans and room sizes provided by the school district as well as by visual inspection of all school sites, the study team will prepare an inventory of school sites and buildings currently owned by North Clackamas School District which identifies substandard classrooms plus any facility considered obsolete or inadequate.

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*It should be noted that additions to the original contract were agreed upon between the two parties and are detailed in Sections 1, 4, and 5 of the report.

1.2 Using 1970-71 school census data provided by the school district and Clackamas Intermediate Education District and/or 1970 U.S. Census summary tapes, the study team will survey the geographical distribution of students and pre-school children in North Clackamas School District. The study team will:

1.21 Summarize selected data items (age, household size, housing characteristics, etc.) by block from 1970 census summary tapes

1.22 Assign U.S. census block numbers to school census records and summarize pupils by age

1.23 Add state plane geographic coordinates to blocks to permit plotting of data and geographic compares

1.24 Produce machine plots of selected data items by block for visual analysis

1.3 The study team will produce enrollment projections on an annual basis for a period of five years and for a period of ten and twenty years. Specifically the study team will:

1.31 Produce enrollment projections for selected grade groupings for each of the next five years (1972-73, 1973-74, 1974-75, 1975-76, 1976-77)

1.32 Forecast school age children by census tract for the years 1982 and 1992

Section 2.0 Prepare recommendations for the vertical grade organization of schools in North Clackamas School District. In developing these recommendations the study team will:

2.1 Conduct a review of available literature and research as well as current practices

2.2 Consult with representative students and patrons of North Clackamas School District (advisory board members and elected student leaders)

Section 3.0 Prepare recommendations for optimum size (ADM) for the grade organizations identified in 2.0 above. Consideration will be given such factors as educational program, opportunity of student involvement in co-curricular activities, and economic feasibility. In developing these recommendations the study team will:

3.1 Conduct a review of available literature and research as well as current practices

3.2 Consult with representative students and patrons of North Clackamas School District (advisory board members and elected student leaders)

Sections 4.0 and 5.0 Prepare recommendations regarding size, number, general location and attendance area designations for existing and projected schools for the period 1972-1992. The study will:

4.1 Review and analyze data generated in 1.0, 2.0, and 3.0

4.2 (a) Develop a computer model for examining various attendance boundaries, or
(b) Prepare by hand visual representations of recommended attendance boundaries

Section 6.0 Prepare estimates of the cost impact of establishing kindergarten instruction throughout the district

Section 7.0 Develop a master plan including a time management chart for the construction of facilities in the North Clackamas School District. The master plan will be based on:

7.1 An analysis of all data generated in sections 1.0 through 6.0 of this proposal

7.2 Consultative assistance of a professional architect

SECTION 1

BASIC INFORMATION

The contract drawn up between the North Clackamas School District and the Bureau of Educational Research and Service listed the following tasks to be performed by way of obtaining basic information for the study (1.0 Obtain basic information needed to develop a master plan for school facility construction).

1.1 Inventory of sites and buildings

1.2 Geographical distribution of students and pre-school children

1.3 Enrollment projections

The school and site inventory was based on the following portion of the contract:

> 1.1 Using data from maps, plot plans, and room sizes provided by the school district as well as by visual inspection of all school sites, the study team will prepare an inventory of school sites and buildings currently owned by North Clackamas School District which identifies sub-standard classrooms plus any facility considered obsolete or inadequate.

Data on the geographical distribution of students and pre-school children were developed in conformance to the next portion of the contract:

> 1.2 Using 1970-71 school census data provided by the school district and Clackamas Intermediate Education District and/or 1970 U.S. Census summary tapes, the study team will survey the geographical distribution of students and pre-school children in North Clackamas School District.

Enrollment projections were completed in response to the next request:

> 1.3 The study team will produce enrollment projections on an annual basis for a period of five years and for a period of ten and twenty years.

This section, then, presents the basic information on existing facilities, geographical distribution of students, and enrollment projections which is needed to develop a master plan for proposed facility construction in the North Clackamas district.

1.1 Building and Site Inventory

Introduction

This portion of the study presents in outline form a description and statements of adequacy of each school and its site in the North Clackamas School District. The information was obtained from visits to the schools and from written and verbal data provided by various school administrators.

Each outline describes, in brief, the physical facilities of the school, includes statements regarding current enrollments and practical utilization enrollments, and lists concerns and recommendations for the district's consideration.

The judgments of adequacy expressed herein are based on common practice and on Minimum State Standards for Oregon Public Schools.

Standards Pertaining to Capacity and Utilization

Before the capacity of a school is determined, certain assumptions must be made about the amount of space needed for each child. Once these assumptions have been made, they may be utilized to compute the number of pupils per room and, subsequently, the capacity of the school. Table 1.1 - 1 shows the assumptions that have been used in this study.

In addition to the assumptions concerning the amount of space per pupil, the study used recommended standards for class size from the State of Oregon Minimum Standards and standards for maximum class sizes furnished by the North Clackamas School District.

The following examples will serve to illustrate how these assumptions and standards were applied.

Example #1: A large room of 1500 square feet is used for a sixth-grade classroom. If the 30 square-foot per pupil assumption

Table 1.1 - 1

PER PUPIL SQUARE-FOOT ASSUMPTIONS

Instructional Area	Sq. Ft. Per Pupil
Classrooms	30 elementary 25 secondary
Science Laboratories	50
Home Economics	50
Shop--General	125
Shop--Vocational Education	150
Typing Classrooms	40
Arts and Crafts Rooms	50
Band Rooms	50
Special Education	60

is applied, the capacity would be computed at 50 pupils. However, state minimum standards limit elementary school class enrollment to 25 pupils in grades 1-3 and to 30 pupils in grades 4-8. In this case, 30 pupils would be assigned to that particular room.

Example #2. A high school room used for English has 932 square feet. If the 25 square-foot per pupil assumption is applied, the capacity would be computed at 37 pupils. However, since the district policy limits the number of students taught per day per teacher in English to 125 students, and since each teacher at that particular school teaches 5 periods a day, the capacity would be computed as 125 ÷ 5 or 25 students.

In the event that the district limitation exceeded the computed figure based on the square-foot assumption, the smaller figure was used. For

example, if room size were 600 square feet, the maximum enrollment would be computed at 24 pupils (600 ÷ 25 = 24) and not the 28 limit set by the district.

In determining the capacity of a school building, one derives a figure indicating the maximum number of students that can be housed in a facility consistent with the class load limitations established by the local district. Because of uncontrollable factors, it becomes impossible in actual practice to maintain maximum capacity in every class. In the high schools, the fact that students can make choices of subjects prevents classroom utilization to a maximum degree. Many subjects are offered to allow the student a wider range of educational opportunities, and oftentimes enrollment in such classes is smaller.

The concern, then, is at what level a building should be considered utilized at its optimal practical limits. Commonly accepted assumptions include 90 percent for elementary schools and 85 percent for secondary schools. These assumptions were used in this study.

Standards Pertaining to Site Size

The adequacy of the school site size was determined by making a comparison with the state minimum standards. The state of Oregon indicates the following minimum requirements of sites for new buildings or enlargements of existing school buildings:[1]

1. Elementary school--any combination of grades 1 through 8.	Five usable acres, plus one usable acre for each 100 children or fraction thereof of ultimate building capacity.
2. Junior high and high schools--any of grades 7 through 12.	Ten usable acres, plus one usable acre for each 100 children or fraction thereof of ultimate building capacity.

[1]State of Oregon, Minimum Standards for Public Schools, 1966, p. 19.

Ardenwald Elementary School

I. Buildings

A. Main building
1. 8 classrooms
2. Office area
a. Reception area
b. Principal's office
c. Health room
d. Special Education room
e. Lavatory
3. Library (27' x 36')
4. Cafeteria and kitchen
a. Walk-in cooler
b. Storage area
5. Gymnasium
a. Stage
b. 2 locker rooms below stage
6. Teachers' room
7. Storage room (12' x 16')
8. Restrooms - boys' and girls'
9. Basement
a. Art center (31' x 36')
b. Boiler room

B. Annex #1
1. 4 classrooms
2. Restrooms - boys' and girls'

C. Annex #2
1. 4 classrooms
2. Restrooms - boys' and girls'

II. Site--7.75 acres

A. Size is adequate for a school of 200 pupils

B. A noise problem is created by location of outdoor covered play shed, joined to building next to present library.

C. Location of site is near St. John's parochial school, which if closed might place a demand on Ardenwald to receive approximately 50 more pupils in grades 1-6.

D. Population in this area appears to be stabilized after dropping for several years.

E. Most pupils walk--only one bus serving school.

III. Current utilization--grades 1-6

A. 16 classrooms

B. 369 pupils

IV. Summary

A. Utilization
1. Currently housing 369 pupils
2. Assumed maximum capacity of 400
3. Practical capacity computed at 360
4. Currently utilized at 103 percent of practical capacity

B. Adequacy
1. Facilities in Annex 1 and 2 are adequate.
2. Facilities in main building are old but adequate with continued maintenance.
3. Library-media center is inadequate in size for a complete library program.
4. Library electrical wiring is inadequate for demands placed on it.
5. Adequacy of basement art room is impaired by lack of water.
6. Play shed creates a noise problem.

V. Concerns and recommendations

A. Keep enrollment at present level which is 103 percent of practical capacity. (By present state standards this school cannot be expanded without the acquisition of additional property.)

B. Replace heavy cafeteria tables with portable tables, thus making this open space more readily available.

C. Check electrical wiring in library for overload.

D. Examine possibility of enlarging library. One alternative would be to expand into area now covered by the play shed.

E. Relocate play shed away from building to eliminate noise problem in library and adjacent classroom.

Table 1.1 - 2

ARDENWALD ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 2	30	875	29	25	25		20
2	Grade 1	30	962	32	25	25		23
3	Grade 1	30	875	29	25	25		22
4	Grade 2	30	962	32	25	25		23
5	Grade 3	30	875	29	25	25		22
6	Grade 5	30	962	32	28	28		25
7	Grade 2	30	875	29	25	25		20
8	Grade 3	30	962	32	25	25		23
9	Grade 4	30	759	25	28	25		22
10	Grade 4	30	736	24	28	24		22
11	Grade 4	30	736	24	28	24		21
12	Grade 3	30	645	21	25	21		18
13	Grade 6	30	759	25	28	25		32
14	Grade 6	30	759	25	28	25		33
15	Grade 5	30	759	25	28	25		23
16	Grade 5	30	972	32	28	28		20
						400	360	369

The current enrollment of 369 students represents 103 percent school utilization based on the practical classroom capacity of 360 students.

Battin Elementary School

I. Building

A. Main floor
1. 12 classrooms
2. Office area
a. Reception area
b. Principal's office
c. Health room
d. Work area
e. Restroom
3. Library
a. Teachers' room
b. Boys' and girls' restrooms
4. Gym-cafetorium
a. Stage
b. Boys' and girls' restrooms
5. Kitchen
a. Walk-in cooler
b. Pantry
c. Lavatory for cooks

B. Basement
1. Activity room 19' x 31' (plus 9' x 10')
2. Title I room
3. Special Education room
4. Supply room (21' x 27')
5. Furnace room

II. Site--3.77 acres

A. Size of site is inadequate by present state standards.

B. Adjacent property on west with house and property may be available for purchase.

C. This school serves a transient community.

III. Utilization, grades 1-6

A. 12 classrooms

B. 259 pupils

IV. Summary

A. Utilization
1. Currently housing 259 pupils
2. Assumed maximum capacity of 304 pupils
3. Practical classroom capacity of 275 pupils
4. Currently utilized at 95 percent of practical capacity

B. Adequacy
   1. Classrooms are adequate in size and function.
   2. Library, occupying one room, is too small for a complete library program.
   3. Furnace is inadequate.
      a. Evidence of hang-fires
      b. Not heating properly
   4. Storage for cafeteria bulk food storage is inadequate--stage currently used for this purpose.

V. Concerns and recommendations

A. If retained as a school site, consider purchasing property on west side of school property.

B. Replace or extensively repair present furnace.

C. Provide additional storage for cafeteria.

D. Keep enrollment near present level which is 95 percent of practical capacity.

Table 1.1 - 3

BATTIN ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1C	Grade 4	30	806	26	28	26		26
2C	Grade 6	30	806	26	28	26		18
3C	Grade 6	30	806	26	28	26		19
4C	Grade 5	30	806	26	28	26		23
5C	Grade 1	30	960	32	25	25		20
6C	Grades 1 and 2	30	960	32	25	25		18
7C	Grade 1	30	960	32	25	25		20
8C	Grade 2	30	960	32	25	25		23
9C	Grade 2	30	972	32	25	25		20
10C	Grades 4 and 5	30	972	32	25	25		22
11C	Grade 3	30	972	32	25	25		25
12C	Grade 3	30	972	32	25	25		25
						304	273	259

An enrollment of 259 students represents 95 percent utilization based on practical classroom capacity of 273 students.

Bilquist Elementary School

I. Building

A. One main building constructed in stages
   1. Original construction 1960
   2. 6 classrooms and a gym at east end added in 1966

B. Facilities
   1. 20 basic classrooms 28' x 38' 8"
      a. 19 currently used as classrooms
      b. 1 used as a library
   2. Office area
      a. Principal's office and reception area
      b. Health room
      c. Faculty room
      d. Reading room
   3. Small counselor's room (13' 10" x 34' 8")
   4. 2 gymnasiums
      #1 49' x 80'
         a. Stage
         b. 2 storage rooms
      #2 49' x 77' (now used for classrooms)
         a. Storage room
         b. Boys' and girls' shower rooms
   5. 6 restrooms
   6. Music room--only part of building that is second story
   7. Kitchen
   8. Boiler room
   9. Storage for custodial supplies

II. Site--14.65 acres

1. Size is adequate by current state standards for 900 pupils.
2. Site could handle an expanded facility.
3. Access roads are dangerous
   a. Webster road has no adequate shoulders for walking
   b. Road is heavily trafficked.
4. House and property adjacent to school is surrounded by school property.

III. Current utilization

A. Grades 1-5
   1. 19 classrooms
   2. 507 pupils

B. Grade 4
   1. 3 classes occupy gymnasium, which has been carpeted.
   2. 90 pupils are enrolled.

IV. Summary

A. Utilization
1. Currently housing 597 pupils
2. Assumed maximum capacity of 475
3. Practical classroom capacity of 438
4. Currently utilized at 136 percent of practical capacity

B. Adequacy
1. Classrooms are adequate in size and function.
2. Library is too small in area for school this size--900 sq. ft. not adequate to house library materials and allow enough seating for largest class.
3. Gymnasium is inadequate for classroom area. Noise level is high.
4. Kitchen is barely adequate.
   a. Feeding 300 to 400 pupils daily
   b. No eating area--all pupils eat in their home rooms

V. Concerns and recommendations

1. Adjust enrollment to a reasonable level--450 pupils using 18 classrooms.
2. Expand library into adjacent room (#15). Use gym carpeting for library area.
3. Consider purchase of contiguous property now surrounded by school property.

Table 1.1 - 4

BILQUIST ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 1	30	970	32	25	25		27
2	Grade 1	30	970	32	25	25		27
3	Grade 1	30	970	32	25	25		26
4	Grade 1	30	970	32	25	25		26
5	Grade 1	30	970	32	25	25		28
6	Grade 2	30	970	32	25	25		25
7	Grade 2	30	970	32	25	25		25
8	Grade 2	30	970	32	25	25		25
9	Grade 2	30	970	32	25	25		25
10	Grade 3	30	970	32	25	25		26
11	Grade 3	30	970	32	25	25		26
12	Grade 3	30	970	32	25	25		26
13	Grade 3	30	970	32	25	25		26
14	Grade 4	30	970	32	28	28		29
15	Grade 4	30	970	32	28	28		29
18	Grade 5	30	970	32	28	28		30
19	Grade 5	30	970	32	28	28		31
20	Grade 2	30	970	32	25	25		25
21	Grade 2	30	970	32	25	25		25
Gym	Grade 4 (3 classes)	30	3,773					90
						475	438	597

An enrollment of 597 students represents 136 percent utilization based on practical classroom capacity of 438 students.

Hector Campbell Elementary School

I. Buildings

A. 5 square classroom buildings constructed in 1957 and 1958
1. Each contains 4 classrooms (24' x 33')
2. Each quad has its own oil-heating unit
3. 18 rooms are used as classrooms
4. 2 rooms are used for a library

B. Oneservice building constructed 1957
1. 175' x 40'
2. Office area and health room
3. Kitchen
4. Cafetorium and multipurpose room
5. Heating unit (gas fired)

II. Site--8.09 acres

A. Terraced

B. Size adequate for 300 pupils by current state standards

C. Play area functionally adequate

III. Current utilization--grades 1-6

A. 18 classrooms

B. 402 pupils

IV. Summary

A. Utilization
1. Currently housing 402 pupils
2. Assumed maximum capacity of 459
3. Practical classroom capacity of 413
4. Currently utilized at 97 percent of practical classroom capacity

B. Adequacy
1. Classrooms are adequate in size and function.
2. Library in regular-size classroom (792 square feet) has inadequate space for library materials and seating.

V. Concerns and recommendations

A. Connect two classrooms currently used for the library and for AV material by a doorway, thus providing greater convenience and flexibility.

B. Continue to use near present utilization rate.

C. If considering expansion, acquire additional property.

Table 1.1 - 5

HECTOR CAMPBELL ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
2B	Grade 2	30	792	26	25	25		15
3B	Grade 3	30	792	26	25	25		25
4B	Grade 3	30	792	26	25	25		22
5B	Grade 2	30	792	26	25	25		22
2C	Grade 1	30	792	26	25	25		22
3C	Grade 2	30	792	26	25	25		22
4C	Grade 1	30	792	26	25	25		24
5C	Grade 1	30	792	26	25	25		23
2D	Grade 4	30	792	26	28	26		23
3D	Grade 3	30	792	26	25	25		14
4D	Grade 4	30	792	26	28	26		23
5D	Grade 4	30	792	26	28	26		22
2E	Grade 6	30	792	26	28	26		24
3E	Grade 5	30	792	26	28	26		24
2F	Grade 5	30	792	26	28	26		23
3F	Grade 6	30	792	26	28	26		24
4F	Grade 5	30	792	26	28	26		25
5F	Grade 6	30	792	26	28	26		25
						459	413	402

An enrollment of 402 students represents 97 percent utilization based on practical classroom capacity of 413 students.

Carver Elementary School

I. Building

A. First floor
1. 2 classrooms
2. Gymnasium - 40' x 60'
3. Restrooms - boys' and girls'

B. Basement
1. One classroom (607 square feet)
2. Kitchen-cafeteria
3. Furnace room
4. 2 unfinished storerooms

II. Site--3.08 acres

A. Inadequate in size by current state standards

B. Bordered by a sawmill on one side

III. Current utilization--grades 1-3

1. Two classrooms occupied
a. Grades 1-2 in one
b. Grades 2-3 in one
2. 55 pupils

IV. Summary

A. Utilization
1. Currently housing 55 pupils
2. Assumed maximum capacity of 70
3. Practical capacity of 63 pupils
4. Currently utilized at 76 percent practical capacity

B. Adequacy
1. Classrooms are the high-ceiling, old-fashioned type, but quite functional.
2. Kitchen and cafeteria are adequate.
3. Gymnasium provides excellent indoor play area.

V. Concerns and recommendations

A. Have building checked for fire safety; particularly, have boiler room safety factors checked.

B. If building judged safe, continue to use as community school, at least for younger pupils.

C. Phase out later where not needed or definitely inadequate.

Table 1.1 - 6

CARVER ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1st floor	Grades 1 and 2	30	913	30	25	25		21
1st floor	Grades 2 and 3	30	913	30	25	25		34
Base-ment	Empty	30	607	20	25	20		--
						70	63	55

An enrollment of 55 students represents 87 percent utilization based on practical classroom capacity of 63 students.

Clackamas Elementary School

I. Buildings

A. Original (1938 construction)
1. 9 classrooms
2. Office area
a. Principal's office
b. Reception area
c. Health room
3. Gymnasium (42' x 70')
a. Stage
b. Locker room
c. Storage
d. Restrooms - boys' and girls'
4. Restrooms - boys' and girls' (1 each)
5. Boiler room
6. Basement
a. Library
b. Teachers' room
c. Reading classroom

B. Additional wing
1. 11 classrooms
2. Cafeteria and kitchen
3. Restrooms - 2 boys' and 2 girls'
4. Teachers' room
5. Storage area

C. Old church (across street)
1. Two-story
2. Currently used for music and community kindergarten

II. Site--7.08 acres

A. Adequate by current state standards for 200 pupils

B. According to principal, location in an area zoned for industrial and commercial use

III. Current utilization--grades 1-6

A. 20 classrooms

B. 577 pupils

IV. Summary

A. Utilization
1. Currently housing 577 pupils
2. Assumed maximum capacity of 532
3. Practical capacity of 480
4. Currently utilized at 120 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size and function
   2. Library inadequate
      a. Size too small
      b. Location in basement poor
      c. Now shared with county
   3. Cafeteria
      a. At capacity
      b. Serves as P.E. area part time
      c. Grades 5 and 6 eat in classrooms
      d. Needs more storage space
   4. Gymnasium--inadequate size--too small for demands placed upon it by current enrollment

V. Concerns and recommendations

1. Limit enrollment to approximately 480
2. Increase library facilities
   a. Move county branch library from present elementary library
   b. Continue use of basement facilities with minor remodeling
3. Do not consider expansion at this site due to business and industry in area.
4. Consider relocation when feasible.

Table 1.1 - 7

CLACKAMAS ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
20	Grade 1	30	960	32	25	25		25
19	Grade 1	30	800	26	25	25		26
18	Grade 2	30	800	26	25	25		26
17	Grade 2	30	736	24	25	24		25
16	Grade 3	30	704	23	25	23		28
15	Grade 3	30	704	23	25	23		28
14	Grade 4	30	800	26	28	26		30
13	Grade 4	30	750	25	28	25		28
12	Grade 5	30	960	32	28	28		32
11	Grade 5	30	910	30	28	28		32
10	Grade 5	30	910	30	28	28		32
9	Grade 5	30	910	30	28	28		33
8	Grade 5	30	910	30	28	28		32
7	Grade 6	30	910	30	28	28		29
6	Grade 6	30	891	29	28	28		28
5	Grade 6	30	891	29	28	28		28
4	Grade 6	30	891	29	28	28		29
3	Grade 6	30	891	29	28	28		30
2	Grade 6	30	891	29	28	28		28
1	Grade 6	30	924	30	28	28		28
						532	480	577

An enrollment of 577 students represents 120 percent utilization of practical classroom capacity of 480 students.

Happy Valley Elementary School

I. Buildings

A. Main section constructed in stages about original building (1917). Additions were added in 1951, 1955, 1960, 1962, and 1963.
1. 10 classrooms
2. Office area
   a. Reception area
   b. Principal's office
   c. Health room
   d. Faculty room
   e. Faculty restrooms
3. Library
   a. Reading area
   b. Reference area
   c. Workroom
   d. A-V storage area
4. Special Education room
5. Gymnasium (50' x 111')
   a. Separated into 2 sections with folding partition
   b. Side 2 used as lunchroom
   c. Has individual heating unit
6. Kitchen
   a. Storage area
   b. Scullery across hall
7. Furnace room
8. Restrooms (3 for boys, 3 for girls)
9. 15 storage areas

B. 1967 addition
1. 6 classrooms
2. Heating unit
3. Restrooms (1 each)
4. 3 storage areas

C. Original building
1. First floor (43' x 25')
2. Basement (43' x 25')
3. 3 storage areas

II. Site--10.74 acres

A. Adequate in size by current state standards for 500 pupils

B. Two covered black-topped play areas next to buildings

C. Functionally adequate

III. Current utilization--grades 1-6

A. Main building--grades 1-4
   1. 8 classrooms
   2. 199 pupils
   3. 2 empty rooms

B. 1967 addition--grades 5-6
   1. 4 classrooms
   2. 110 pupils
   3. 2 empty rooms

C. Original building
   Upper floor now used for band

IV. Summary

A. Utilization
   1. Currently housing 309 pupils
   2. Assumed maximum capacity of 430 pupils
   3. Practical capacity of 387 pupils
   4. Currently utilized at 80 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size and function
   2. Site adequate for expansion up to 500 pupils by current state standards
   3. A good plant to add to
      a. Buildings in good condition
      b. Site adequate in size

V. Concerns and recommendations

A. Use four empty rooms to relieve crowded conditions in other elementary schools.

B. Consider expanding facility when population growth warrants.

Table 1.1 - 8

HAPPY VALLEY ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 1	30	1052	35	25	25		18
2	Grade 1	30	1052	35	25	25		19
5	Grade 2	30	1052	35	25	25		28
6	Grade 2	30	1052	35	25	25		28
7	Grade 3	30	1052	35	25	25		24
8	Grade 3	30	1052	35	25	25		26
9	Grade 4	30	1006	33	28	28		27
10	Grade 4	30	991	33	28	28		29
11	Empty		928	30	25-28	25-28		
12	Empty		928	30	25-28	25-28		
14	Grade 5	30	975	32	28	28		27
15	Grade 5	30	975	32	28	28		26
16	Empty		975	32	25-28	25-28		
17	Grade 6		975	32	28	28		29
18	Grade 6	30	975	32	28	28		28
19	Empty	30	975	32	25-28	25-28		
						430	387	309

An enrollment of 309 students represents 80 percent utilization based on practical classroom capacity of 387 students.

Harmony Elementary School

I. Building

A. 13 classrooms (27' x 31')
   1. 12 used as classrooms
   2. 1 used as a library

B. Office area

C. Teachers' room

D. Health room

E. Multipurpose room with stage

F. Cafeteria

G. 2 restrooms

H. Boiler room

I. Storage areas
   1. 1 outside adjacent to stage
   2. 1 in boiler room
   3. Office area

II. Site--5.18 acres

A. Site is inadequate in size by current state standards.

B. Classes at recess cause noise problem for students in classrooms.

C. Site adjoins Dale Ickes Junior High site.

III. Current utilization--grades 1-6

A. 12 classrooms

B. 275 pupils

IV. Summary

A. Utilization
   1. Currently housing 275 pupils
   2. Assumed maximum capacity of 318 pupils
   3. Practical capacity of 286 pupils
   4. Currently utilized at 96 percent of practical capacity

B. Adequacy
   1. Classrooms are adequate in size and function.
   2. Library is now housed in a classroom which is too small in size to house a complete library program including storage and seating.
   3. Multipurpose room is inadequate for all P.E. needs in inclement weather; however, a covered play area helps compensate for this inadequacy.
   4. Fire marshal has recommended outside doors for rooms 1 to 8.

V. Concerns and recommendations

A. Keep enrollment near practical capacity of 286 pupils.

B. Purchase additional property if available; at least three additional acres are needed to be standard for 300 pupils. Adjacent junior high site (Ickes) is not large enough to enlarge elementary site.

C. Examine with fire marshal's representative the need for outside doors in rooms 1-8.

Table 1.1 - 9

HARMONY ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 6	30	837	28	28	28		24
2	Grade 6	30	837	28	28	28		25
3	Grade 5	30	837	28	28	28		24
4	Grade 5	30	837	28	28	28		23
5	Grade 4	30	837	28	28	28		21
6	Grade 4	30	837	28	28	28		24
7	Grade 3	30	837	28	25	25		22
8	Grade 3	30	837	28	25	25		22
9	Grade 2	30	837	28	25	25		20
10	Grade 2	30	837	28	25	25		19
11	Grade 1	30	837	28	25	25		27
12	Grade 1	30	837	28	25	25		24
						318	286	275

An enrollment of 275 students represents 96 percent utilization based on practical classroom capacity of 286 students.

Seth Lewelling Elementary School

I. Buildings

A. Classroom Unit A
1. 6 classrooms
a. 5 used as classrooms
b. 1 used as a music room
2. Restrooms--boys' and girls'
3. Teachers' workroom
4. Furnace and custodial room

B. Classroom Unit B (same as Unit A)--all 6 classrooms used as classrooms

C. Classroom Unit C (same as Unit A)
1. 5 classrooms used for classrooms
2. 1 classroom used for library

D. Classroom Unit D (same as Unit A)--all 6 classrooms used as classrooms

E. Administration unit
1. Reception area
2. Principal's office
3. Health room
4. Workroom
5. Teachers' room
6. Remedial reading room
7. Gymnasium-cafeteria
a. Stage
b. Storage area
8. Kitchen
9. Kitchen storage
10. Boiler room

II. Site--12.48 acres

A. Adequate size by present state standards for 700 pupils

B. Adequate in size for construction of one additional unit

C. Covered patio areas between Units A and B and between C and D

D. Population apparently stable, since Arden Park is reasonably complete in its development.

III. Current utilization--grades 1-6

A. 22 classrooms

B. 529 pupils

C. 1 classroom used as a music room

IV. Summary

A. Utilization
   1. Currently housing 529 pupils
   2. Assumed maximum capacity of 598 pupils
   3. Practical capacity of 538 pupils
   4. Currently utilized at 98 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size and function
   2. Library inadequate in size for conducting a full library program
   3. Support facilities adequate
   4. Site adequate--would permit expansion of buildings

V. Concerns and recommendations

A. Utilize classroom 6, now used for music, as a classroom and rotate the music teacher if space needed.

B. Should future needs develop, consider site as adequate for one additional classroom unit.

C. Consider connecting present library with room 17 as one possible solution to limited library space. This should definitely be considered if school is enlarged.

Table 1.1 - 10

SETH LEWELLING ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 4	30	1000	33	28	28		30
2	Grade 5	30	1000	33	28	28		26
3	Grade 5	30	1000	33	28	28		25
4	Grade 4	30	1000	33	28	28		30
5	Grade 3	30	1000	33	25	25		22
6	Music	30	1000	33	28	28		--
7	Grade 6	30	1000	33	28	28		25
8	Grade 6	30	1000	33	28	28		26
9	Grade 4	30	1000	33	28	28		30
10	Grade 5	30	1000	33	28	28		26
11	Grade 5	30	1000	33	28	28		26
12	Grade 6	30	1000	33	28	28		25
13	Grade 1	30	1000	33	25	25		17
14	Grade 1	30	1000	33	25	25		26
15	Grade 1	30	1000	33	25	25		26
16	Special Education	60	1000	16	15	15		12
17	Grade 1	30	1000	33	25	25		17
18	Grade 3	30	1000	33	25	25		17
19	Grade 3	30	1000	33	25	25		23
20	Grade 3	30	1000	33	25	25		23
21	Grade 2	30	1000	33	25	25		26
22	Grade 2	30	1000	33	25	25		26
23	Grade 2	30	1000	33	25	25		25
						598	538	529

An enrollment of 529 students is 98 percent utilization based on practical classroom capacity of 538 students.

Linwood Elementary School

I. Buildings

A. Main building
1. 8 classrooms in 2 modules of 4 rooms each with a central square for storage and work space
2. Restrooms between every 2 rooms
3. Office area
a. Reception area
b. Principal's office
c. Conference area
d. Teachers' aide work area
e. Health room
f. Safety patrol room
4. Library area
a. Librarian's office
b. Science and A-V storage
c. Special Education room
d. Teachers' room
e. Teachers' restrooms
f. Student restrooms
5. Cafetorium
a. Stage
b. Curriculum office
c. P. E. storage area
6. Kitchen
7. Custodian's room

B. Unfinished classroom block
1. A 4-classroom module
2. Interior unfinished

II. Site--11.86 acres

A. Is adequate in size by present state standards for 500 pupils

B. Has covered play area

III. Current utilization

A. 8 classrooms

B. 168 pupils

IV. Summary

A. Utilization
1. Currently housing 168 pupils
2. Assumed maximum capacity of 196
3. Practical capacity of 176 pupils
4. Currently utilized at 95 percent of practical capacity

B. Adequacy
   1. Classrooms are adequate in size and function.
   2. Common square central area, shared by 4 rooms in each module, appears to lack storage necessary to support the 4 rooms.
   3. Support facilities, kitchen, cafetorium, library, etc. are adequate for a larger enrollment.

V. Concerns and recommendations

A. Complete the present unfinished module of 4 classrooms, modified in central area design to increase storage.
B. Increase storage for present two modules.
C. Consider future expansion of this school to an enrollment of 500 pupils.

Table 1.1 - 11

LINWOOD ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 3	30	950	30	25	25		23
2	Grade 5	30	950	30	28	28		27
3	Grades 3 and 4	30	950	30	25	25		18
4	Grade 4	30	950	30	28	28		24
5	Grade 2	30	950	30	25	25		21
6	Grade 1	30	950	30	25	25		25
7	Grades 1 and 2	30	950	30	25	25		16
8	Sp. Act.	60	950	15	15	15		14
						196	176	168

An enrollment of 168 students represents 95 percent utilization based on practical classroom capacity of 176 students.

Milwaukie Grammar School

I. Building--1 classroom building consisting of the older main construction built in 1924 and a wing attached to the east side of the building constructed in 1949

   A. 20 classrooms

   B. Principal's office

   C. Health room

   D. Auditorium and stage

   E. Combination music-art room

   F. Two interior play courts

   G. Special Education room

   H. Library

   I. A-V room

   J. Faculty room

   K. Cafeteria

   L. Boiler room

   M. District library central processing facilities occupy 2 rooms in basement

   N. Restrooms (2 for boys, 2 for girls)

II. Site--5.75 acres--inadequate by current state standards

III. Current utilization

   A. Grades 1-6
      1. 20 rooms
      2. 462 pupils

IV. Summary

   A. Utilization
      1. Currently housing 462
      2. Assumed maximum capacity of 494
      3. Practical capacity of 445
      4. Currently utilized at 104 percent of practical capacity

B. Adequacy
   1. 11 of the classrooms have less than 750 square feet and are considered small for modern elementary school programs.
   2. Library housed in basement is too small (805 square feet) to house library materials and provide adequate seating.
   3. Principal's office is very small.
   4. Heating seems to be a problem in rooms 14, 15, and 16.

V. Concerns and recommendations

   A. Improve the general maintenance of building.

   B. Relocate library to larger area.

   C. Check heating adequacy.

   D. Enlarge principal's office.

   E. Relocate central library processing center elsewhere in district.

   F. Consider obtaining additional playground area if available.

   G. Phase out the original building as soon as feasible. Retain the six newer rooms at the east end of the school and add the necessary support facilities for a primary school.

Table 1.1 - 12

MILWAUKIE GRAMMAR SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity	Actual Enrollment
1	Grade 5	30	701	23	28	23		20
2	Grade 5	30	681	22	28	22		20
3	Grade 5	30	760	25	28	25		20
4	Grade 6	30	701	23	28	23		26
5	Grade 5	30	688	22	28	22		21
6	Grade 6	30	701	23	28	23		26
7	Grade 6	30	780	26	28	26		26
8	Grade 2	30	878	29	25	25		25
9	Grade 1	30	878	29	25	25		16
10	Grade 2	30	926	30	25	25		22
11	Grade 4	30	681	22	28	22		26
12	A-V room	30	681	22	--	22		A-V
13	Grades 3-4	30	661	22	25	22		25
14	Grade 4	30	701	23	28	23		19
15	Grade 3	30	688	22	25	22		25
16	Grade 4	30	688	22	28	22		24
17	Grade 2	30	946	31	25	25		29
18	Grade 1	30	912	30	25	25		25
19	Grade 1	30	926	30	25	25		21
01	Grade 3	30	836	27	25	25		20
03	Grade 3	30	676	22	25	22		26
						494	445	462

An enrollment of 462 students represents 104 percent utilization based on practical classroom capacity of 445 students.

North Oak Grove Elementary School

I. Building--1 self-contained building, housing

A. Fourteen classrooms (29' x 32')
1. 12 used as classrooms
2. 1 used for a library
3. 1 used for a music room

B. Office area
1. Principal's office
2. Faculty room and restroom
3. Health room

C. Cafeteria-Multipurpose area
1. Kitchen
2. Storage area (no freezer)

II. Site--12.0 acres

A. An adequate site by current state standards for 700 pupils

B. Suitable for expansion

III. Current utilization--grades 1-3

A. 12 classrooms

B. 272 pupils

IV. Summary

Utilization
1. Currently housing 272 pupils
2. Assumed maximum capacity of 325
3. Practical classroom capacity of 293 pupils
4. Currently utilized at 93 percent of practical capacity

V. Concerns and recommendations

A. This is a good facility for expansion if growth warrants.

B. Sunlight is a problem on south-side rooms, numbers 10, 11, and 12.

C. Cold storage arrangements are needed for frozen commodities in kitchen.

Table 1.1 - 13

NORTH OAK GROVE ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 2	30	928	30	25	25		26
2	Grade 3	30	928	30	25	25		26
3	Grade 3	30	928	30	25	25		24
4	Grade 3	30	928	30	25	25		24
5	Grade 3	30	928	30	25	25		25
6	Grade 2	30	928	30	25	25		26
7	Grade 2	30	928	30	25	25		25
8	Grade 1	30	928	30	25	25		18
9	Grade 1	30	928	30	25	25		17
10	Grade 1	30	928	30	25	25		17
11	Grade 1	30	928	30	25	25		19
12	Grade 2	30	928	30	25	25		25
13	Music	30	928	30	25	25		--
						325	293	272

An enrollment of 272 students represents 93 percent utilization based on practical classroom capacity of 293 students.

Oak Grove Elementary School

I. Buildings

A. Two classroom buildings
1. Original construction--1925
a. 14 classrooms
b. Principal's office
c. Library
d. Gymnasium-auditorium w/ stage
e. Boys' and girls' dressing rooms
f. Cafeteria
g. Health room
h. Teachers' room and lavatory
i. Boiler room
j. Restrooms (2 boys', 2 girls')
k. Numerous storage rooms
2. Wing--constructed 1950's
a. 10 classrooms
b. Health room
c. Teachers' room
d. Restrooms (2 boys', 2 girls')
e. Gymnasium

B. Outside gymnasium
1. Size--52' x 89'
2. No dressing rooms

II. Site--7 acres

A. Inadequate by current state standards for junior high use

B. For an elementary school, adequate by current state standards for 200 pupils

C. No track for junior high use

D. Has baseball area developed

E. Adjacent property not available

III. Current utilization

A. Grades 4-6
1. 12 classrooms
2. 304 pupils

B. Grades 7-8
1. 8 classrooms
2. 188 pupils

C. Kindergarten
   1. 2 classrooms
   2. 80 pupils in 2 half-day shifts

IV. Summary

A. Utilization*
   1. Currently housing 537 pupils (572 pupils enrolled, but kindergarten pupils attend 1/2 day, so only 40 kindergartners are present at one time.)
   2. Assumed maximum capacity of 592
   3. Practical classroom capacity of 533 as presently organized
   4. Currently utilized at 100 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size and function
   2. Library inadequate in size; awkward in shape for maximum function
   3. Gym-auditorium lighting poor
   4. No dressing or shower facilities in outside gym
   5. Site inadequate in size

V. Concerns and recommendations

A. Move library to larger area, possibly to rooms 15 and 16.

B. Continue as elementary school; move junior high pupils to another school.

C. Improve gym-auditorium lighting.

D. Maintain continual checks for safety from fire (particularly in lower level of main building).

E. In light of present site size, do not consider expanding this facility.

F. Discontinue use of old building as soon as possible.

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*Although 7th and 8th graders are currently attending this school, the computations herein are based on elementary school assumptions.

Table 1.1 - 14

OAK GROVE ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

	Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
Wing	1	Kindergarten	50	900	18	25	18		19-22
	2	Grade 5	30	900	30	28	28		25
	3	Grade 5	30	900	30	28	28		26
	4	Grade 4	30	900	30	28	28		25
	5	Grade 4	30	900	30	28	28		26
	6	Grade 4	30	900	30	28	28		25
	7	Grade 4	30	900	30	28	28		26
	8	Grade 5	30	900	30	28	28		26
	9	Grade 5	30	900	30	28	28		24
	10	Kindergarten	30	900	30	25	25		23-16
Main	1	Grade 6	30	960	32	28	28		25
Bldg.	2	Grade 6	30	960	32	28	28		25
	3	Music		528					
	6	Band		736					
	7	Grades 7 & 8	30	696	23	30	23		
	8	Grades 7 & 8	30	672	22	30	22		
	9&10	Science 7 & 8	50	1173	23	30	23		
	12	Grades 7 & 8	30	713	23	30	23		
	15	Grade 6	30	960	32	28	28		26
	16	Grades 7 & 8	30	960	32	30	30		
	17	Grades 7 & 8	30	912	30	30	30		
	18	Grades 7 & 8	30	960	32	30	30		
	19	Grades 7 & 8	30	920	30	30	30		
	20	Grade 6	30	874	29	28	30		25
							592	533	537

An enrollment of 537 students represents 100 percent utilization based on practical classroom capacity of 533 students.

Riverside Elementary School

I. Building

A. Upper floor
1. 13 regular classrooms
2. Office area
a. Reception area
b. Principal's office
3. Teachers' room
4. Restrooms - one boys', one girls'

B. Lower floor
1. 7 regular classrooms
2. Cafeteria - kitchen
3. Gymnasium--45' x 80' with stage--28' x 45'
4. Boys' and girls' locker rooms
5. Boys' and girls' restrooms
6. Boiler room with 3 adjoining storage rooms

C. Outside buildings
1. House on school property currently occupied. According to the principal, the occupant has tenant's rights until his death.
2. Empty barn adjacent to house. According to principal, this structure is unusable.

II. Site--9.94 acres

A. Adequate size by current state standards for 400 pupils

B. Generally inadequate for use
1. Asphalt play area next to building usable
2. Most of playground beyond fence bordering the blacktop not usable in wet weather because of lack of adequate drainage.
3. One portion never used because of lack of development

III. Current utilization--grades K-6

A. 20 classrooms

B. 502 pupils

IV. Summary

A. Utilization
1. Currently housing 502 pupils
2. Assumed maximum capacity of 525 pupils
3. Practical capacity computed at 473 pupils
4. Currently utilized at 106 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size and function
   2. Site adequate in size but much of it unusable due to poor drainage
   3. General repairs needed
      a. Roof leaks
      b. Floor tile repair in several rooms

V. Concerns and recommendations

A. Try to maintain enrollment from 450 to 475 pupils which is a practical capacity for this school.

B. Improve site usability by installing adequate drainage system.

C. Check condition of roof.

Table 1.1 - 15

RIVERSIDE ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 1	30	900	30	25	25		23
2	Grade 1	30	900	30	25	25		25
3	Grade 1	30	900	30	25	25		25
4	Grade 2	30	900	30	25	25		27
5	Grade 2	30	900	30	25	25		28
6	Grade 2	30	900	30	25	25		28
7	Grade 3	30	900	30	25	25		27
8	Grade 3	30	900	30	25	25		27
9	Grade 3	30	900	30	25	25		24
10	Grade 6	30	990	33	28	28		22
11	Grade 6	30	990	33	28	28		22
12	Grade 6	30	990	33	28	28		24
13	Grade 5	30	990	33	28	28		27
14	Grades 5 and 6	30	990	33	25	25		24
15	Grade 5	30	990	33	28	28		29
16	Grade 5	30	990	33	28	28		28
17	Grade 4	30	990	33	28	28		21
18	Grade 4	30	990	33	28	28		20
19	Grade 4	30	990	33	28	28		24
--	Kindergarten	50	1,187	23	25	23		22/27
						525	473	502

An enrollment of 502 students represents 106 percent utilization based on practical classroom capacity of 473 students.

Sunnyside Elementary School

I. Buildings--2 buildings connected with a covered walk area

A. 13 classrooms
1. 11 used as classrooms
2. 1 used as a library
3. 1 used as a music room

B. Office area
1. Reception area
2. Principal's office

C. Kitchen

D. Multipurpose room (76' x 48')

E. Teachers' room

F. Two boiler rooms (one in each building)

G. Restrooms
1. 2 for girls
2. 2 for boys
3. 1 for faculty

H. Supply room

II. Site--10.45 acres

A. Adequate as to size by present state standards for 500 pupils

B. Inadequate for full utilization; needs leveling

C. Equipped with black-topped play area adjacent to buildings

III. Current utilization--grades 1-6

A. 11 classrooms

B. 250 pupils

IV. Summary

A. Utilization
1. Currently housing 250 pupils
2. Assumed maximum capacity of 287 pupils
3. Practical capacity of 258 pupils
4. Currently utilized at 97 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size and function
   2. Library, housed in classroom, not large enough to house library materials and to provide adequate space for seating and work areas
   3. Site limited in use because of its roughness and unevenness
   4. Office space limited
   5. No health room
   6. Cafeteria at capacity--a dishwasher would help improve capabilities of this area
   7. Storage area limited
   8. No area for conferences or counseling
   9. Facility expandable on present site to an enrollment of 500 pupils

V. Concerns and recommendations

A. Smooth the playground (More of a smoothing than a leveling project).

B. Add dishwasher if cafeteria is planned for continued local use.

C. Consider as a site which should be expanded if and when growth is experienced. At that time consider needed improvements in support facilities, i.e., enlarge office space, provide health room, and counseling and conference areas, and increase storage.

Table 1.1 - 16

SUNNYSIDE ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
	Grade 1	30	992	33	25	25		
	Grades 1 and 2	30	992	33	25	25		
	Grade 2	30	992	33	25	25		
	Grades 2 and 3	30	1000	33	25	25		
	Grade 3	30	1000	33	25	25		
	Grade 4	30	1009	33	28	28		
	Grade 4	30	1009	33	28	28		
	Grade 5	30	1009	33	28	28		
	Grade 5	30	1009	33	28	28		
	Grade 6	30	762	25	28	25		
	Grade 6	30	762	25	28	25		
						287	258	250

An enrollment of 250 students represents 97 percent utilization based on practical classroom capacity of 258 students.

View Acres Elementary School

I. Building

A. Main floor
1. 20 classrooms
2. Office area
a. Reception area
b. Principal's area
3. Library--30' x 60'
a. Carpeted
b. A-V room
4. Gymnasium
a. Stage--used as dining area
b. Storage area
5. Kitchen
6. Staff lunchroom
7. Restrooms--boys' and girls'

B. Basement
1. 1 classroom
2. Music room
3. Special Education classroom
4. Boiler room
5. Boys' locker room with showers
6. Girls' locker room with showers

II. Site--11.56 acres

A. Adequate in size by present state standards for 600 pupils

B. Drainage problem impairs use of approximately 4 acres of playground

III. Utilization

A. 21 classrooms

B. 629 pupils--604 at any one time since 52 kindergarten pupils are divided into two half-day sessions

C. 30 kindergarten pupils from this area attend at Concord Junior High

IV. Summary

A. Utilization
1. Currently housing 604 pupils
2. Assumed maximum capacity of 543
3. Practical capacity of 480
4. Currently utilized at 126 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size and function.
   2. Site adequate in size but has a drainage problem and needs leveling (now largely unusable).
   3. Access to playground at southeast corner of building unsafe--needs steps and walkway.

V. Concerns and recommendations

Improve the site as follows:

A. Install drain system and add fill dirt on lower play area.

B. Develop unused area of playground to maximize use of site. (Consider removing trees to enlarge playground area.)

C. Add steps and walkway at southeast corner of building to provide safer access to playground.

Table 1.1 - 17

VIEW ACRES ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Kindergarten	50	759	15	25	15		25/27
2	Grade 4	30	759	25	28	25		31
4	Grade 2	30	759	25	25	25		26
5	Grade 5	30	924	30	28	28		32
6	Grade 2	30	759	25	25	25		27
7	Grade 2	30	759	25	25	25		27
8	Grade 5	30	759	25	28	25		32
9	Grade 2	30	759	25	25	25		24
10	Grade 5	30	759	25	28	25		33
11	Grade 3	30	759	25	25	25		30
12	Grade 4	30	759	25	28	25		30
13	Grade 3	30	759	25	25	25		30
14	Grade 4	30	759	25	28	25		30
15	Grade 1	30	759	25	25	25		20
16	Grade 1	30	759	25	25	25		19
17	Grade 1	30	759	25	25	25		20
18	Grade 1	30	759	25	25	25		21
19	Grade 6	30	759	25	28	28		35
20	Grade 6	30	759	25	28	28		35
21	Grade 6	30	759	25	28	28		35
22	Grade 3	30	759	25	25	25		31
--	Sp. Ed.	60	364	6	15	6		9
						543	480	604

An enrollment of 604 students represents 126 percent of practical classroom capacity of 480 students.

Lot Whitcomb Elementary School

I. Building

A. 23 classrooms

B. Office area

C. Library--now occupying 2 classrooms

D. Multipurpose room with stage--97' x 52'

E. Teachers' room

F. Kitchen

G. Restrooms--5 boys' and 5 girls'

H. Boiler room

I. Storage areas

II. Site--11.20 acres

A. Adequate in size for up to 600 pupils by current standards

B. Drainage apparently the only problem on this site

C. Covered play area adjacent to building

III. Current utilization--grades 1-6

A. 20 classrooms used with regular classes--471 pupils

B. 1 classroom used for Special Education--14 pupils

C. 1 classroom used for Title I program

D. 1 classroom used for library reference room

IV. Summary

A. Utilization
1. Currently housing 485 pupils
2. Assumed maximum capacity of 569
3. Practical capacity of 512
4. Currently utilized at 95 percent of practical classroom capacity

B. Adequacy
   1. Classrooms adequate in size and function.
   2. Library adequate as long as present 2 rooms can be utilized.
   3. No cafeteria--pupils eat in classrooms from food carts. Appears to work well.
   4. Covered play area very breezy.
   5. Use of playground limited by lack of drainage.

V. Concerns and recommendations

A. If necessary to alleviate overcrowding elsewhere in the district, consider utilizing the 3 classrooms used now for Special Education, Title I and library reference area as classrooms to accommodate 75 additional pupils.

B. Consider adding windbreaks for outside covered play area.

C. Consider improving playground drainage.

D. Building as presently utilized is operating at a reasonable enrollment level.

Table 1.1 - 18

LOT WHITCOMB ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 1	30	891	29	25	25		21
2	Title I		891			25		--
3	Grade 6	30	891	29	28	28		28
4	Grade 6	30	891	29	28	28		26
5	Sp. Ed.	60	891	14	15	14		14
6	Grade 6	30	891	29	28	28		28
7	Grade 1	30	891	29	25	25		24
8	Grade 1	30	891	29	25	25		27
9	Grade 2	30	891	29	25	25		28
10	Grade 2	30	891	29	25	25		18
12	Grade 4	30	891	29	28	28		29
13	Grade 4	30	891	29	28	28		21
14	Grade 3	30	891	29	25	25		25
15	Grade 4	30	891	29	28	28		24
16	Grade 3	30	891	29	25	25		22
17	Grade 3	30	891	29	25	25		17
18	Grade 2	30	891	29	25	25		25
19	Grade 3	30	891	29	25	25		24
20	Grade 5	30	891	29	28	28		22
21	Grade 5	30	891	29	28	28		23
22	Grade 5	30	891	29	28	28		21
23	Grade 5	30	891	29	28	28		18
						569	512	485

An enrollment of 485 students represents 95 percent utilization based on practical classroom capacity of 512 students.

Wichita Elementary School

I. Building

A. Main Floor
1. 12 classrooms
2. Office area
a. Reception area
b. Principal's office
c. Health room
d. Faculty room
3. Gymnasium--49' x 70'
a. Stage
b. A-V storage
c. Chair storage room
4. Special Education room
5. Art storage room
6. Restrooms--boys' and girls'
7. Furnace room

B. Basement
1. Cafeteria and kitchen
a. Cook's office
b. Storage
2. Music room
3. Library--23' x 44'
4. Band room
5. Playroom

II. Site--4.45 acres

A. Inadequate in size by current state standards

B. No adjacent property available for expansion

C. No covered play areas

III. Current Utilization

A. 12 rooms

B. 277 pupils

IV. Summary

A. Utilization
1. Currently housing 277 pupils
2. Assumed maximum capacity of 295 pupils
3. Practical capacity of 266 pupils
4. Currently utilized at 104 percent of practical capacity

B. Adequacy
   1. Classrooms adequate in size although rooms 1, 2, 3, 5 and 6 are just under 750 square feet.
   2. Site inadequate in size by current state standards
   3. Restrooms in older portion of building in poor condition
   4. Boilers apparently in poor condition
   5. Library limited in size

V. Concerns and recommendations

A. Check efficiency of entire heating system.

B. Remodel older restrooms.

C. Consider minor remodeling in basement if additional library space is needed. Play area could be used as a kindergarten facility.

D. Keep enrollment at present level for best utilization of this facility.

Table 1.1 - 19

WICHITA ELEMENTARY SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 90%)	Actual Enrollment
1	Grade 4	30	736	24	28	24		25
2	Grade 4	30	736	24	28	24		26
3	Grade 6	30	736	24	28	24		19
4	Grade 6	30	782	26	28	26		20
5	Grade 5	30	736	24	28	24		25
6	Grade 5	30	713	23	28	23		26
7	Grade 2	30	897	29	25	25		19
8	Grade 2	30	897	29	25	25		22
9	Grade 3	30	897	29	25	25		24
10	Grade 1	30	936	31	25	25		24
11	Grade 3	30	936	31	25	25		28
12	Grade 1	30	936	31	25	25		19
						295	266	277

An enrollment of 277 pupils represents 104 percent utilization based on practical classroom capacity of 266 students.

Concord Junior High School

I. Building

A. First floor
1. 9 classrooms
2. Kitchen--lunchroom
3. Kitchen storage area
4. Playroom
5. Boys' and girls' locker rooms
6. Boys' and girls' restrooms
7. Custodian's area and storage
8. Heating area

B. Second floor
1. 8 classrooms
2. Library
3. Workroom
4. Office area
   a. Reception area
   b. Principal's office
   c. 3 Counseling offices
5. Music room
6. Teachers' room
   a. Workroom adjoining
   b. Restrooms
7. Gymnasium
8. Playroom
9. Boys' and girls' restrooms

II. Site--6.35 acres

A. Site is inadequate by current state standards.

B. Site was originally developed as an elementary school site--one portion now partially in disrepair and not being used.

C. Concrete sloped wall on Spaulding Street end of building appears to be hazardous.

D. Site might possibly be enlarged by acquiring property across Concord Road. This would require construction of an overpass for safe access to pupils.

III. Current utilization--grades 7-8

A. 20 teaching stations

B. 366 pupils--grades 7 and 8

C. 30 kindergarten pupils

IV. Summary

A. Utilization
   1. Currently housing 366 pupils
   2. Assumed maximum capacity of 514 pupils
   3. Practical capacity of 437 pupils
   4. Currently utilized at 84 percent of practical capacity

B. Adequacy
   1. Shop facilities are too small
      --only 825 square feet.
   2. Electrical work is needed throughout building to increase circuit capacity.
   3. Facilities originally designed for an elementary school need considerable remodeling to accommodate a junior high curriculum.
      a. Home economics rooms need major remodeling.
      b. Exercise room has poor lighting.
      c. Chalk boards, sinks, plumbing are at elementary school height.
      d. Gym lighting is poor; stage, hazardous.
      e. Kitchen needs more storage.
   4. Site is inadequate in size and condition.
   5. Lunchroom needs brightening.

V. Concerns and recommendations

A. Keep enrollment at 400 to 450.

B. Have electrical circuits checked.

C. Consider any remodeling plans in light of whether or not to continue use of this school as a junior high. It might be best to utilize it as an elementary school and thus avoid extensive remodeling.

D. If retained as a junior high school, remodel home economics and shop facilities.

E. Enlarge the kitchen storage.

F. Improve the gymnasium lighting, and check stage area safety.

G. Raise chalkboards.

Table 1.1 - 20

CONCORD JUNIOR HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
10	F. Lang./Posture	25	825	33	33	33		
11	Kindergarten	50	825	16	33	16		
12	Math	25	825	33	33	33		
13	Home Ec.	50	825	33	33	33		
14	Math	25	825	27	33	27		
15	Home Ec.	50	825	33	33	33		
16	Shop & Crafts	125	825	6	33	6		
17	Science	50	825	16	33	16		
18	Art	50	1127	22	33	22		
20	F. Lang./Soc. St.	25	825	33	33	33		
21	L. Arts/Soc. St.	25	825	33	33	33		
22	L. Arts/Soc. St.	25	825	33	33	33		
23	L. Arts/Soc. St.	25	825	33	33	33		
24	Math/Science	25	825	33	33	33		
25	Science	50	825	16	33	16		
26	L. Arts/Soc. St.	25	825	33	33	33		
27	Art/Drama	30	616	20		20		
	Library		1078					
	Music	50	1124	22		22		
	Play Room		2700			33		
Gym	P.E.		4000			33		
						514	437	366

An enrollment of 366 students represents 84 percent utilization based on practical classroom capacity of 437 pupils.

Dale Ickes Junior High School

I. Building

A. Classrooms
1. 20 regular classrooms
2. 2 science rooms
3. Band room
4. Home economics room
5. Shop

B. Support facilities
1. Office area
a. Reception area
b. Principal's office
c. Work area
2. Library--32' x 49'
3. Counseling area
a. Boys' counseling area with office for counselor
b. Girls' counseling area with office for counselor
c. 2 counseling offices in library area
4. Large gymnasium--60' x 80'
a. Stage
b. Boys' dressing room
c. Girls' dressing room
5. Small gymnasium--33' x 55'
6. Restrooms
a. 2 boys'
b. 2 girls'
7. Special Education room
8. Faculty room

II. Site--8.24 acres

A. Inadequate size by current state standards--need a total of 16 acres for this size school

B. Function of this site appears adequate

III. Current utilization--grades 7-8

A. 600 pupils

B. 27 teaching stations

IV. Summary

A. Utilization
1. Currently housing 600 pupils
2. Assumed maximum capacity of 793

3. Practical capacity of 674
4. Currently utilized at 89 percent of practical capacity

B. Adequacy
1. Classrooms adequate in size and function.
2. Site size inadequate in size by current state standards. Future expansion not possible without the acquisition of additional property.
3. No cafeteria--food prepared in kitchen and placed in steam tables. Pupils eat in classrooms. Appears to be a satisfactory arrangement.
4. Food storage area inadequate--currently storing food supplies in hallway.
5. Library inadequate in space for a school this size. Need additional space to house library materials and to provide adequate seating and work space.

V. Concerns and recommendations

A. Consider providing needed additional storage space for cafeteria supplies.

B. As one possibility for enlarging library, consider expanding into present courtyard area.

Table 1.1 - 21

DALE ICKES JUNIOR HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
1	Health	25	891	35	33	33		
2	Math	25	891	35	33	33		
3	Core	25	891	35	33	33		
4	Core/Spanish	25	891	35	33	33		
5	Core - 8th	25	891	35	33	33		
6	Core - 8th	25	891	35	33	33		
7	Core - 8th	25	891	35	33	33		
8	Core - 7th	25	891	35	33	33		
9	Core - 7th	25	891	35	33	33		
10	Core - 7th	25	891	35	33	33		
11	Core - 7th	25	891	35	33	33		
12	Math	25	891	35	33	33		
13	Art	25	891	35	33	33		
14	Core - 8th	25	891	35	33	33		
15	Core - 8th	25	891	35	33	33		
16	Core - 7th	25	891	35	33	33		
17	Science/Reading	50	891	17	33	17		
18	Science	50	891	17	33	17		
19	Science	50	891	17	33	17		
20	Science	50	891	17	33	17		
21	Math	25	891	35	33	33		
22	Music	25	891	35	80	35		
Home Ec	Home Ec	50	1400	28	33	28		
Band Rm	Band/Music	50	1225	24	80	24		
Lrg. Gym	P.E.				33	33		
Sm. Gym	P.E.				33	33		
Shop	Shop	125	1400	11		11		
						793	674	600

An enrollment of 600 students represents 89 percent utilization based on practical classroom capacity of 674 students.

John McLoughlin Middle School

I. Building

A. Upper level
1. 9 regular classrooms
2. Home economics room
3. Music room
4. Office area
5. Library--29' x 60'
6. Kitchen - cafetorium (46' x 63') with stage
7. Gymnasium
8. Restrooms--boys' and girls'
9. Janitor's storage room

B. Lower level
1. 3 regular classrooms
2. Shop and storage area
3. Art room-unfinished
4. Boys' and girls' locker rooms
5. Boiler room

II. Site--15.18 acres

A. Adequate in size for up to 500 pupils by current state standards.

B. Road in front of building heavily trafficked--no sidewalks

III. Current Utilization

A. 361 pupils

B. 18 teaching stations

IV. Summary

A. Utilization
1. Currently housing 361 pupils
2. Assumed maximum capacity of 500
3. Practical capacity of 425 pupils
4. Currently utilized at 85 percent of practical capacity

B. Adequacy
1. Classrooms adequate in size and function
2. General building inadequacies due to
a. Unfinished art room
b. Omissions in original construction of adequate storage areas
3. Inadequate spectator seating in gym

V. Concerns and recommendations

A. Finish art room as soon as possible.

B. Plan additional storage areas...possibly additional space could be found by utilizing what appears to be unused hallway space.

Table 1.1 - 22

JOHN MCLOUGHLIN MIDDLE SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
200	Spanish	25	754	30	33	30		
207	L. Arts/Soc. St.	25	841	33	33	33		
208	Home Ec.	50	1,248	24	33	24		
400	L. Arts/Soc. St.	25	784	31	33	31		
401	L. Arts/Soc. St.	25	784	31	33	31		
408	Math	25	900	36	33	33		
409	Soc. St.	25	900	36	33	33		
410	L. Arts	25	900	36	33	33		
411	Sp. Ed.	60	900	15	15	15		
412	L. Arts/Soc. St.	25	900	36	33	33		
602	Science	50	1,015	20	33	20		
603	Science	50	1,015	20	33	20		
604	Sci./Math	25	841	33	33	33		
Shop	Shop	125	2,100	16	33	16		
Gym #1	P.E.				33	33		
#2	P.E.				33	33		
	Music	50	1,421	28	33	28		
	Art	50	1,050	21	33	21		
						500	425	361

An enrollment of 361 students represents 85 percent utilization based on practical classroom capacity of 425.

Milwaukie Junior High School

I. Building

A. Main floor
1. 5 regular classrooms
2. Home economics room
3. Office area
4. Restrooms--boys' and girls'
5. 2 storage areas
6. Gymnasium--59' x 93'
a. Stage
b. Band room

B. Upper floor
1. 6 regular classrooms
2. Library--24' x 59'
3. 2 counseling rooms
4. Health room
5. Women's restroom

C. Basement
1. Science room
2. Shop
3. Kitchen, cafeteria, storage room
4. Teachers' room
5. Boys' and girls' locker rooms
6. Special Education room
7. Boiler room
8. Custodian's room and storage

II. Site--7.24 acres

A. Inadequate size by current state standards

B. Expansion not possible without additional property

III. Current utilization--grades 7-8

A. 300 pupils

B. 16 teaching stations

IV. Summary

A. Utilization
1. Currently housing 300 pupils
2. Assumed maximum capacity of 425 pupils
3. Practical capacity of 361 pupils
4. Currently utilized at 83 percent of practical capacity

B. Adequacy
   1. Regular classrooms functionally adequate though small in size which limits class size
   2. Home economics - art room
      a. Used one semester as an art room and one semester as a home economics room
      b. Not adequate in size for either use--sharing the room makes it difficult to properly set up for either use
   3. Poor location of science room, although remodeled
   4. Serious lack of room for physical education activities requiring equipment, e.g., tumbling, gymnastics
      a. Need storage space for equipment
      b. Need additional activity area to set up apparatus without using main floor of gym
      c. Currently using lunchroom for some P.E. activities
   5. Band room needed; currently using the stage

V. Concerns and recommendations

   A. Do not consider extensive remodeling of this facility unless sufficient adjacent property can be purchased to bring site to state standards--should have a minimum of 8 additional acres.

   B. If additional property not available, consider phasing out this site.

   C. Do not increase present enrollment beyond 360 pupils with facilities in their present condition.

Table 1.1 - 23

MILWAUKIE JUNIOR HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
1	Reading	25	660	26	33	26		
2	Core	25	660	26	33	26		
3	Music	25	704	28	33	28		
4	Core	25	720	28	33	28		
5	Math	25	720	28	33	28		
6	Health	25	704	28	33	28		
7	Core	25	704	28	33	28		
8	Core	25	720	28	33	28		
9	Math	25	720	28	33	28		
11	Core	25	682	27	33	27		
12	Core	25	726	29	33	29		
Science	Science	50	1008	20	33	20		
Shop	Shop & Crafts	125	1890	15	33	15		
Home Ec.	Home Ec./Art	50	1032	20	33	20		
Gym	P.E.		5487		33	33		
Stage	Band		1152		33	33		
						425	361	300

An enrollment of 300 students represents 83 percent utilization based on practical classroom capacity of 361 pupils.

Wilbur Rowe Junior High School

I. Building

A. Classrooms
1. 20 regular size classrooms
2. 4 science rooms with connecting storage areas
3. Home economics room
4. Art room
5. Music room
6. Shop

B. Support facilities
1. Office area
a. Reception area
b. Principal's office
c. Health room
d. Work area and storage
e. Special Education room
2. Cafeteria--70' x 47'
3. Kitchen with 2 storage areas
4. Gymnasium--87' x 60'
a. Stage and storage
b. Boys' and girls' locker rooms
5. Upper P.E. room--70' x 47'
6. Library--56' x 44'

II. Site--13.84 acres

A. Adequate in size for enrollment of 300

B. Area behind the building sloping and terraced--not too usable

III. Current utilization--grades 7-8

A. Currently using 10½ of the standard-sized rooms

B. 409 pupils

C. 9½ regular classrooms and art room unused

IV. Summary

A. Utilization
1. Currently housing 409 pupils
2. Assumed maximum capacity of 910
3. Practical capacity of 774 pupils
4. Currently utilized at 53 percent of practical capacity

B. Adequacy
1. A very adequate school
2. Site size barely adequate in size for current enrollment

3. Site sloping and terraced which minimizes its use--It also has a drainage problem on the lower terrace.

V. Concerns and recommendations

A. Make maximum use of this excellent facility--should house at least 700 pupils.

B. Install drain system on lower terrace behind building.

C. Consider acquisition of additional property to maximize use of this facility.

Table 1.1 - 24

WILBUR ROWE JUNIOR HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
1	Core	25	899	35	33	33		
2	Core	25	899	35	33	33		
3	Core	25	899	35	33	33		
4	Core	25	899	35	33	33		
5	Open	25	899	35	33	33		
6	Open	25	899	35	33	33		
7	Core/Open½	25	899	35	33	33		
8	Core/Spanish	25	899	35	33	33		
9	Core/Open½	25	899	35	33	33		
10	Science/Open½	50	1,147	22	33	22		
11	Science	50	1,147	22	33	22		
12	Music	50	1,720	34	33	33		
13	Shop	125	2,091	16	33	16		
15	Open	25	899	35	33	33		
16	Read/Lit.	25	899	35	33	33		
17	Open	25	899	35	33	33		
18	Open	25	899	35	33	33		
19	Open/Orch.	25	899	35	33	33		
20	Open	25	899	35	33	33		
21	Open	25	899	35	33	33		
22	Math	25	899	35	33	33		
23	Open	25	899	35	33	33		
24	Open	25	899	35	33	33		
25	Science	50	1,147	22	33	22		
26	Science	50	1,147	22	33	22		
27	Sp. Ed.	60	899	15	15	15		
28	Home Ec.	50	1,638	32	33	32		
29	Art	50	1,719	34	33	33		

Table 1.1 - 24 (cont.)

WILBUR ROWE JUNIOR HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
Gym	P.E.		5,220			33		
Upper P.E. Rm.	P.E.		3,290			33		
						910	774	409

An enrollment of 409 students represents 53 percent utilization based on practical classroom capacity of 774 students.

Clackamas High School

I. Building

A. Classrooms
1. 52 classrooms
2. 8 additional teaching stations located in
a. Auditorium (1)
b. Little theater (1)
c. Gymnasium (5)
d. Library conference area (1)

B. Support facilities
1. Office areas
a. Reception area
b. Principal's office
c. Vice-principal's office
d. Deans' offices (2)
e. Counseling offices (4)
f. Bookkeeper's office
g. Instructional secretary's office
h. Attendance office
i. Nurse and clinic area
j. Activity director's office
k. Curriculum director's office
2. Library
a. Conference room
b. Book room
3. Teachers' lounge
4. Auditorium
5. Teachers' study
6. Student center
7. A-V storage room
8. Cafeteria-kitchen
9. Faculty lunchroom
10. Custodian's room
11. Boiler room

II. Site--34.36 acres

A. Adequate size by current state standards for 2400 students

B. Functionally adequate

III. Current utilization--grades 9-12

A. 1684 pupils
1. Running a split shift part time
2. Seven-period day with staggered starting times
3. All pupils in attendance during periods 2-6

B. 60 teaching stations

IV. Summary

A. Utilization
1. Currently housing 1684 pupils
2. Assumed maximum capacity of 1630 pupils
3. Practical capacity computed at 1385 pupils
4. Currently utilized at 121 percent of practical capacity

B. Adequacy
1. Boys' physical education facilities inadequate to meet present demands, particularly with regard to dressing and shower facilities.
2. Auditorium, originally designed to be subdivided for large group work, apparently seldom used in this manner.
3. All other available space apparently utilized

V. Concerns and recommendations

A. Transfer up to 200 pupils from Clackamas to Milwaukie High School. This will lessen many of the present inadequacies.

B. Consider site size adequate for expansion if future plans call for this.

C. In present situation, hold enrollment of this plant to under 1500.

Table 1.1 - 25

CLACKAMAS HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
21	Science/Chem.	50	1050	21	24	21		
22	Science/Physics	50	1080	21	24	21		
23	Soc. St.	25	729	29	30	29		
24	Soc. St.	25	900	36	30	30		
25	Soc. St.	25	870	34	30	30		
26	Soc. St.	25	870	34	30	30		
27	Soc. St.	25	810	32	30	30		
28	Soc. St.	25	870	34	30	30		
30	Health	25	1650	66	28	28		
31	Eng.	25	1320	52	31	31		
32	Soc. St.	25	810	32	30	30		
33	Soc. St.	25	870	34	30	30		
34	Eng.	25	900	36	31	31		
35	Soc. St.	25	810	32	30	30		
37	Aud./Drama	25	9680		30	30		
41	Eng.	25	729	29	31	31		
42	Eng.	25	810	32	31	31		
43	Eng.	25	702	28	31	28		
44	Eng.	25	810	32	31	31		
45	Eng.	25	570	22	31	22		
46	Eng.	25	810	32	31	31		
47	Math	25	702	28	30	28		
48	For. Lang.	25	810	32	30	30		
49	For. Lang.	25	729	29	30	29		
49A	For. Lang	25	810	32	30	30		
5A	Speech	25	875	35	30	30		
51	Science Lab	50	810	16	24	16		

Table 1.1 - 25 (cont.)

CLACKAMAS HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
52	Math	25	729	29	30	29		
53	Biology	50	900	17	30	17		
54	Math	25	729	29	30	29		
55	Biology	50	1440	28	30	28		
56	English	25	810	32	31	31		
57	Math	25	729	29	30	29		
58	English	25	810	32	31	31		
59	English	25	729	29	31	29		
59A	English	25	810	32	31	31		
60	Typing	40	720	18	50	18		
61	Typing	40	936	23	50	23		
62	Office Prac.	40	432	10	24	10		
63	Bus. Ed.	25	648	25	30	25		
65	Bkkp./Bus. Ed.	25	810	32	30	30		
66	Drafting	50	864	17	30	17		
67	Art	50	576	11	30	11		
71	Wood Shop	125	2242	17	24	17		
72	Wood Shop	125	1368	10	24	10		
73	Art	50	1786	35	30	30		
74	Home Ec.	50	1053	21	24	21		
75	Home Ec.	50	2886	57	24	24		
[illegible]	Band	50	1872	37	80	37		
77	Vocal Music	50	1365	27	80	27		
78	Agric.	25	936	37	24	24		
79	Metals	125	2808	22	24	22		
4A	Rem. Reading	25	297	11	15	11		
Gym	P.E. (5 stations)				40	40		
Cafeteria	Study Hall				40	40		
						1630	1385	1684

An enrollment of 1684 students represents 121 percent utilization based on the practical classroom capacity of 1385 students.

Milwaukie High School

I. Buildings

A. Main building--constructed 1924
1. 38 classrooms
2. Office area
a. Reception area
b. Principal's office
c. Work area
d. Vice-principal's office
e. Conference area
3. Guidance area
a. Reception area
b. Dean's office
c. Counseling offices (4)
d. Boys' clinic office
e. Girls' clinic office
4. Student center
5. Cafeteria and kitchen area
6. Library
7. 10 teachers' workrooms
8. Restrooms
a. 5 boys' - 5 girls'
b. 2 men's - 2 women's

B. Business Annex
1. 5 classrooms
2. Faculty room
3. Restrooms--2 boys', 2 girls'

C. Gymnasium
1. 4 classrooms
2. 2 gym areas
3. Apparatus room

D. Shop building
1. 3 teaching areas downstairs
a. Metal
b. Wood
c. Arts and crafts
2. Darkroom upstairs
3. Restrooms--1 boys', 1 girls'

E. Burke House (home economics building)
1. Formerly a residence
2. 5 rooms with kitchen and bathroom on ground floor--1077 square feet

F. Home Economics House
1. Two-story house with full basement
2. 1,400 square feet on ground floor

G. Band building
   1. 2,620 square feet
   2. Restrooms--1 boys', 1 girls'

II. Site--23.24 acres--site adequate for 1,300 students

III. Current utilization--grades 9-12

A. 57 teaching stations in 7 buildings including two rooms in nearby church

B. 1,365 pupils

IV. Summary

A. Utilization
   1. Currently housing 1,365 pupils
   2. School capable of handling up to 1,600 pupils according to feeling of principal
   3. Assumed maximum capacity computed at 1,703
   4. Practical capacity computed at 1,448
   5. Currently utilized at 94 percent of practical capacity

B. Adequacy
   1. Cafeteria serving area inadequate for demands placed upon it
   2. Classrooms adequate in size and function
   3. Site functionally adequate
   4. New band-choral and auditorium facilities being constructed

V. Concerns and recommendations

A. Make maximum use of this facility to take advantage of recent remodeling and new additions being completed.

B. Transfer up to 200 pupils from Clackamas to Milwaukie High School.

Table 1.1 - 26

MILWAUKIE HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
102	Math, U.S. Govt.	25	936	37	30	30		
103	Math, S.H., Voc. Ed.	25	792	31	30	30		
104	Fam. Lv., H. Ec.	50	1.012	20	24	20		
105	S.H., Home Ec.	50	1,144	22	24	22		
121	Cafeteria, S.H.	25				100		
202	U.S. Govt., S.H. R & R	25	1,040	40	30	30		
203	S.H., L. Arts, Eng.	25	1,200	48	25	25		
204	L. Arts, Hum., Prob. Solvg.	25	960	38	25	25		
205	Lang. Arts	25	1,080	42	25	25		
206	Soc. St., Geom., S.H.	25	1,080	42	30	30		
208	Lang. Arts	25	980	39	25	25		
209	Eng., Algebra	25	616	24	25	24		
210	Span./French	25	616	24	30	24		
211	Mech. Dr., Ind. Arts	50	1,260	25	24	24		
212	Reading, English	25	660	26	25	25		
213	French, S.H.	25	660	26	30	26		
214	Math	25	986	39	30	30		
215	Eng., Ag. Sci., L. Arts, S.H.	25	660	26	25	25		
216	Ger., Eng., S.H., Spanish	25	704	28	30	28		
217	Soc. Iss., S.H.	25	792	31	30	30		
218	Math, S.H.	25	720	28	30	28		
219	Library	25	---	--	--	--		

Table 1.1 - 26 (cont.)

MILWAUKIE HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
302	Eng., L. Arts, S.H.	25	910	36	25	25		
303	R & R, S.H.	25	770	30	25	25		
304	Latin, Soc. St., S.H.	25	704	28	30	28		
305	E & S Sci., Elec., Ind. Arts	50	924	18	24	18		
306	Biology, S.H.	50	880	17	30	17		
307	Biology, S.H.	50	1,296	25	30	25		
308	Lang. Arts	25	720	28	25	25		
309	L. Arts, Gen. Math	25	960	38	25	25		
310	Art., Geo.	25	480	19	30	19		
311	L. Arts, Bus. Law	25	600	24	25	24		
312	Chem., Adv. Sci., S. H.	50	1,305	26	24	24		
313	Phys. Sci., Phys., E & S Sci.	50	1,560	31	24	24		
314	Geo., S. H.	25	986	39	30	30		
315	Math, S. H.	25	630	25	30	25		
B-20	Math, Shthnd., Acctng., S.H.	25	870	34	30	30		
B-22	W. Prob., ISMS, Ind. Math	25	737	29	30	29		
B-30	Typing	40	1,260	31	50	31		
B-32	Office prac. act.	25	495	19	24	19		
B-40	L. Arts, Journ., publ., S.H.	25	840	33	25	25		

Table 1.1 - 26 (cont.)

MILWAUKIE HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
BB-1	Band and Orch.	50	2,620	52	80	52		
BH-1	Speech	25			30	30		
CH-1	Vocal music	25			80	80		
G-11	Art	50			30	30		
G-13	P.E.				40	40		
G-13	P.E.				40	40		
G-13	P.E.				40	40		
G-21	Drama, L. Arts	25			30	30		
G-22	S.H.				--	30		
G-23	P.E. (3 stations)				40	40		
HH-1	Home Ec.	50			24	24		
IA-2	Wood Sh., Ind. Arts	125	3,000	25	24	24		
IA-3	Art, ceramics	50	3,750	75	30	30		
IA-4	Metals, Ind. Arts	125	3,000	25	24	24		
IA-5	Photography	50			15	15		
						1,703	1,448	1,365

An enrollment of 1,365 students represents 94 percent utilization based on practical classroom capacity of 1,448 students.

Rex Putnam High School

I. Building

A. Classrooms
1. 26 regular
2. 4 science laboratories
3. 2 special education rooms
4. 3 business education rooms
5. 3 home economics areas (food, clothing, home living)

B. Shops and special rooms
1. Arts and crafts room
2. Drafting room
3. Wood shop
4. Metal shop
5. Band room
6. Choral room
7. Little theater - auditorium

C. Support facilities
1. Office area
a. Reception area
b. Principal's office
c. Vice-principal's office
d. Conference room
e. Student body office
f. Attendance office
g. Bookkeeper's office
2. Counseling area
a. Reception area
b. 5 counseling offices
c. 2 health rooms
d. Nurse's office
3. Library
a. A-V area
b. Darkroom
c. Shop
d. Workroom
e. Storage
f. Professional library room
g. Preview room
h. Office
4. Student store
5. 10 faculty offices
6. Faculty lounge
7. Faculty lounge and lunchroom
8. Kitchen and cafeteria
9. Gymnasium--2 levels
a. 2 floors
b. Boys' and girls' locker rooms

c. P.E. activity room
d. Wrestling room
e. Equipment drying room
f. Restrooms

10. Restrooms
    a. 4 boys'
    b. 4 girls'
    c. 4 faculty
11. Mechanical room--furnace area
12. General and custodial storage in all sections of the building

II. Site--28.8 acres--adequate size by current state standards for 1800 pupils

III. Current utilization

A. 54 teaching stations

B. 1450 pupils

IV. Summary

A. Utilization
    1. Currently housing 1450 pupils
    2. Assumed maximum capacity of 1549 pupils
    3. Practical capacity of 1317
    4. Currently utilized at 110 percent of practical capacity

B. Adequacy
    1. Regular classrooms, shops, and special rooms adequate in size and function, with exception of typing rooms which are overcrowded
    2. Storage areas inadequate in size and number
        a. Weight room beneath biology area used for storage
        b. Apparently caused by lack of central storage facility in district
        c. A problem in most areas of the building

V. Concerns and recommendations

A. Consider Rex Putnam a very adequate school plant.

B. Where possible, consider minor remodeling to increase storage.

Table 1.1 - 27

REX PUTNAM HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
A-1	Soc. St.	25	932	37	30	30		
A-1	Soc. St.	25	702	28	30	28		
A-1	Soc. St.	25	702	28	30	28		
A-2	English	25	932	28	25	25		
A-2	English	25	702	28	25	25		
A-2	English	25	702	28	25	25		
A-3	Chemistry	50	1410	28	24	24		
A-4	Physics	50	1380	27	24	24		
A-5	Student Pub.	25	532	21	--	21		
A-6	Adv. Math	25	806	32	30	30		
A-7	Bkkp./Off. Prac.	40	1014	25	24	24		
A-8	Shthnd./Typing	40	1014	25	30	25		
A-9	Soc. St.	25	836	33	30	30		
A-10	Language	25	806	32	30	30		
A-11-12	Sm. Conf. Rm.	25	496	19	--	19		
A-13	Language	25	598	23	30	23		
A-14	Language	25	598	23	30	23		
*A-15-16	Sm. Conf. Rm.	25	496	19	--	19		
A-17	Speech	25	1014	40	30	30		
B-1	English	25	932	37	25	25		
B-1	English	25	702	28	25	25		
B-1	English	25	702	28	25	25		
B-2	Soc. St.	25	932	37	30	30		
B-2	Soc. St.	25	702	28	30	28		
B-2	Soc. St.	25	702	28	30	28		
B-3	Biology	50	1410	28	30	28		
B-4	Biology	50	1410	28	30	28		

*used as a classroom

Table 1.1 - 27 (cont.)

REX PUTNAM HIGH SCHOOL--BUILDING UTILIZATION BY ROOM

Room No.	Room Use	Assumed Sq. Ft. Per Pupil	Sq. Ft. Area	Capacity by Sq. Ft. Assumption	District Class Load Limit	Assumed Maximum Classroom Capacity	Practical Classroom Capacity (at 85%)	Actual Enrollment
B-5	English	25	700	28	25	25		
B-6	Sp. Ed.	60	1014	16	15	15		
B-7	Sp. Ed.	60	1170	19	15	15		
B-8	Typing	40	1220	30	50	30		
B-9	Soc. St.	25	806	32	30	30		
B-10	Latin/B. Eng.	25	806	32	25	25		
B-11	Soc. St.	25	625	25	30	25		
B-12	Math	25	806	32	30	30		
B-13	Soc. St.	25	1014	40	30	30		
B-14	Math	25	806	32	30	30		
C-1	Foods Lab	50	1333	26	24	24		
C-1	Clothing	50	1333	26	24	24		
D-1	Arts and Crafts	50	1880	37	30	30		
D-2	Drafting	50	1408	28	30	28		
D-3	Metals Shop	125	2088	16	25	16		
D-4	Wood Shop	125	2497	20	25	20		
D-6	Choral Room	25	1408	56	80	56		
D-7	Band Room	50	1628	32	80	32		
	Little Theater	25	2750	110	30	30		
	Stud. Ctr./Lunch Rm.					50		
	Cafeteria/S.H.					50		
Gym 1	P.E.				40	40		
Gym 2	P.E.				40	40		
Gym 3	P.E.				40	40		
Gym 4	P.E.				40	18		
H. Library	Study Hall					55		
Aud.	Drama					40		
						1549	1317	1450

An enrollment of 1450 students represents 110 percent utilization based on practical classroom capacity of 1317 students.

1.2 Geographical Distribution of Students

The following information, supplied by the Bureau of Governmental Research, has been presented under separate cover. Information on the completion and transmittal of these materials is noted in parentheses.

1.2 Using 1970-71 school census data provided by the school district and Clackamas Intermediate Education District and/or 1970 U. S. Census summary tapes, the study team will survey the geographical distribution of students and pre-school children in North Clackamas School District. The study team will:

1.21 Summarize selected data items (age, household size, housing characteristics, etc.) by block from 1970 census summary tapes

(Tables of data by block, block group and census tract completed and bound copies of computer listings given to school district and Bureau of Educational Research in January.)

1.22 Assign U. S. Census block numbers to school census records and summarize pupils by age

(Summary tables of one-year ages by census blocks, block group and tract given to school district and Bureau of Educational Research in February.)

1.23 Add state plane geographic coordinates to blocks to permit plotting of data and geographic compares

(Products made possible by this step listed in 1.24 below.)

1.24 Produce machine plots of selected data items by block for visual analysis

(Six machine plots at scale of 1"=1000' made and delivered on March 15. Plots are of Senior high school students ['72-'73], Junior high students ['72-'73], 1-6 grade students ['72-'73], 9th grade students ['72-'73], 9th grade students ['73-'74], 9th grade students ['74-'75].)

1.3 Enrollment Projections

Enrollment projections for selected grade groupings and for selected years were completed according to contract and are submitted under separate cover. (See notations in parentheses.)

1.3 The study team will produce enrollment projections on an annual basis for a period of five years and for a period of ten and twenty years. Specifically the study team will:

1.31 Produce enrollment projections for selected grade groupings for each of the next five years--1972-73, 1973-74, 1974-75, 1975-76, 1976-77.

(Completed by Bureau of Educational Research and Service and submitted under separate cover.)

1.32 Forecast school-age children by census tract for the years 1982 and 1992

(Completed by Bureau of Governmental Research: Forecasts of 6-17 age group by census tract, and 6-17 by one-year age groups for school district for 1982 and 1992. Also included are work and analysis tables of housing unit trends, total population trends, structure types, household size, fertility rates.)

Several items of work and specific products seem to relate to more than one of the contract components, or were agreed-upon additions to the contract work. They are listed somewhat randomly below:

1. Preparation of base maps and base data. Photo reduction of census block map to scale of 1"=1000' and making of acetate transparency for dry-print reproduction of base maps. Aerial photo secured from Oregon State Highway Department (1965). Preparation of maps showing current attendance boundaries, census tracts, and block groups, blocks defined for computer model, and significant features. (Acetate transparencies to be turned over to school district at end of project.)

2. Computer listing of all enrollment-data records sorted by address.

3. Tables (computer generated) of enrollment data by census block, block group and tract by grades 1-8, with some kindergarten and Special Achievement students identified.

4. Tables (computer generated) of enrollment data--census block group by age, by grade.

5. Six machine plots of enrollment data at scale of 1"=1000'. Grades 1-6 plotted individually by block.

6. Map of high school age-group children by block group for entire school district and by block along attendance boundaries (from U. S. Census data). Hand-plotted overlays on base map. (Completed in January.)

7. Table comparisons of U. S. Census, school census, and enrollment data to evaluate validity of data sources. Comparisons indicate remarkable consistency with the exception of the 4- and 5-year-old counts from the school census.

8. Computer tape prepared for Bureau of Educational Research and Service, including six data-sets (formats of data also furnished). Tape includes (1) pre-processed address index for North Clackamas area; (2) block number-block coordinate file; (3) school census raw data records with tract and block added; (4) school census block summary records by one-year age groups with block, tract, and block coordinates added; (5) enrollment raw data records with tract and block added; and (6) enrollment block summary records by grade levels with block, tract, and block coordinates added.

SECTION 2

VERTICAL GRADE ORGANIZATION

This report represents recommendations regarding vertical grade organization for the North Clackamas School District in fulfillment of component 2.0 of the contract between the North Clackamas School District and the Bureau of Educational Research and Service. In developing these recommendations the Bureau team reviewed the pertinent research and literature and gathered information from the students and patrons of the school district. Bureau staff members met with the student leaders in each of the junior and senior high schools and with parent advisory groups for discussion and information. Questionnaires were distributed to 150 students and 20 advisory group members soliciting information regarding vertical grade organization and school size. A total of 110 student questionnaires and 8 parent questionnaires were returned.

Determining the ideal vertical organizational pattern is a continuing problem for educators. Generally, vertical organization refers to a method of distributing and advancing students from grade to grade through an educational program. The vertical plan can be graded, multigraded, or nongraded, or a combination of these patterns.

The graded plan originated in the mid-nineteenth century as a system of assigning students by age to a single classroom teacher. Traditionally,

the student has passed along to the next grade by satisfactorily covering a specified amount of educational material in a one-year period. As knowledge of human growth and development has increased, many educators have begun to question the graded school concept. One alternative introduced is multigrading--a plan wherein classes are composed of students of several ages, abilities, interests, and grade levels. Multigrading is based on the assumption that heterogeneous classes are more motivational for children than homogeneous classes--that differences in composition of a class are more conducive to a stimulating learning environment than are likenesses.

The nongraded plan is another alternative to the traditional, graded plan. In nongraded schools, students are assigned to classes on some criterion other than age. Nongrading is an attempt to eliminate grades from the vertical organization and provide a more natural flow of student advancement through the system. Its purpose is to allow each child to progress through the school at his own individual rate, regardless of age level.

Theoretically, the extremes in vertical organization range from a plan in which children of each age-grade level are completely separated from those in other grades, to a totally nongraded program wherein each individual passes through the entire system at his own rate. Realistically, the dual problem is deciding which age-grade levels should be grouped in a single building and how the children should be distributed. This leaves open the alternatives of grading, nongrading, or multigrading.

2.1 Review of Literature

Criteria

Quality education can, of course, occur within any organizational structure, but certain types of organizational arrangements may contribute more to improved education than others. John Goodlad (1963) identifies three questions to be asked when judging the adequacy of school organization.

1. Does the organization encourage continuous progress for each child without undue pauses or traumatic shifts in procedures?
2. Do alternatives exist for children not profiting from the existing organizational format?
3. Does the organizational structure encourage a reasonable balance of success and failure? (It is estimated that 25 percent of the children experience 75 percent of the failure.)

The difficulty in answering these questions occurs in identifying the criteria to use in determining which organizational plan provides the best educational experiences. Educators have never agreed upon these criteria, but the following guidelines seem to be frequently used in educational research in attempting to identify the optimum vertical grade organization.

Human development. Most plans for grouping students by grade levels take into consideration the level of human development and the rate of growth of the children concerned. Specific aspects of human development which are generally used as criteria are academic status, social and emotional development, and physical maturity.

Individual differences. If there is any one criterion which has caused concern among educational planners in the recent past, it is the knowledge that individuals differ socially, intellectually, and physically. Schools should by organized in ways which indicate maximum consideration of those individual and group differences.

Cultural forces. Schools have always been influenced by the operative cultural forces and trends. The social dynamics of any particular age group are significant criteria which must be considered when planning educational programs.

Efficiency. The financial and physical constraints imposed upon a district's decision makers are important factors in educational planning. The planners are given the task of organizing the schools in a way that provides the best opportunities for quality education in the most economical way. Both limited budgets and existing physical facilities establish limitations on the alternatives.

Alternative Vertical Organizational Patterns

Theoretically, the number of alternative organizational patterns is limited only by pupil enrollment. Realistically, the number of alternatives is relatively small. For instance, no one would realistically suggest having a separate building for five-year-olds, a separate building for six-year-olds, one for seven-year-olds, etc. The alternatives, then, are limited to what age-level children should be grouped in a single facility. For clarity, grade-level designations will be used to describe the different plans. Multigrading or nongrading remain alternatives within distinct facilities, however.

Common organizational patterns include elementary, junior high, and senior high designations. For instance, frequently identifiable patterns

are (1) K-8, 9-12, or (2) K-6, 7-9, 10-12, or (3) K-6, 7-8, 9-12. Recent trends in educational organization favor the "middle school" concept and the four-year high school. This results in organizational patterns of K-4, 5-8, 9-12 or K-5, 6-8, 9-12. Table 2.1 - 1 illustrates the recent trends in organizational patterns.

Table 2.1 - 1

PERCENTAGE OF SCHOOL SYSTEMS USING VARIOUS PATTERNS OF SCHOOL ORGANIZATION FOR YEARS INDICATED

Grade Groupings	NEA Study 1947-48 (1,372 Cities)	NEA Study 1958-59 (3,242 Districts)	NEA Report 1966 (12,130 Districts)
6-3-3	35	29	21.5
6-6	16	24	22.4
6-2-4	12	19	11.9
8-4	23	15	21.4
7-5	3	2	3.4
Others (6-3-3-2, 6-2-4-2, 5-3-4, 7-2-3, 4-4-4, etc.)	11	11	19.4
	100	100	100.0

SOURCE: 1947-48: National Education Assn., Research Division, "Trends in City School Organization, 1938 to 1948," Research Bulletin 27 (Feb. 1949); 1958-59: National Education Assn., Research Division, "Administrative Practices in Urban School Districts, 1958-59," Research Report 1961-R10; 1966: National Education Assn., Research Division, "Public School Programs and Practices," Research Bulletin 45 (Dec. 1967), estimated percents for 12,130 school systems enrolling 300 or more pupils based on a stratified sample of 716 systems.

The Middle School

In recent years, over 2,000 middle schools of varying grade-level organizations have been established in the fifty states. Generally, middle-school converts agree that grades 5-8 or 6-8 are the appropriate middle-school years, but some states refer to their 7-8 schools as middle schools. In no case is grade 9 included in a middle school. Table 2.1 - 2 illustrates the distribution of these schools by states in 1968.

Betty Read (1969) suggests two reasons for the growth of the middle-school concept: (1) dissatisfaction with the traditional junior high school as it generally exists today, and (2) desire to provide a program for children at the middle-school level which overcomes the problems that exist with the traditional (7-9) junior high school.

There are at least two reasons for dissatisfaction with the traditional junior high school. First, many of the original purposes of the junior high school are no longer relevant in the 1970's. But even if relevant, the schools are not perceived as achieving the purposes for which they were established. Supposedly, the junior high school was created to provide secondary education at an earlier age to bridge the gap between the self-contained elementary classroom and the specialized program of the high school, to provide exploratory experiences for students before making commitments in high school, and to offer guidance in academic, vocational, and personal matters. Second, the student population served by the junior high school is changing, and the junior high school no longer seems appropriate for the pre-adolescent period in the student's life.

The key to the middle-school concept is the child whom this particular school serves, the transescent. Transescence is "the period in human development which begins late in childhood, prior to the onset of puberty and

Table 2.1 - 2

1968 SURVEY OF 50 STATES BY DIVISION OF EDUCATIONAL RESEARCH AND SERVICE. UNIVERSITY OF MONTANA

Rank	Name of State	5-6-7-8	6-7-8	7-8	Total
1	Texas	55	183	192	430
2	Massachusetts	23	38	59	120
3	New Jersey	32	47	39	118
4	Wisconsin	16	26	71	113
5½	Missouri	5	7	89	101
5½	New York	38	63	--	101
7	Michigan	27	63	--	90
8	Virginia	16	23	47	86
9	Indiana	--	20	62	82
10	Maine	18	30	23	71
11	Georgia	9	10	39	58
12	North Carolina	12	18	22	52
13	Connecticut	21	19	9	49
14	Iowa	10	18	13	41
15	Washington	5	13	20	38
16	Alabama	10	7	20	37
17	Pennsylvania	5	30	1	36
18	Kentucky	7	11	17	35
19	Louisiana	5	10	19	34
20	California	28	--	--	28
22	North Dakota	1	--	25	26
22	Oregon	16	10	--	26
22	Rhode Island	9	6	11	26
24	Kansas	1	6	16	23
25	Colorado	7	13	--	20
26	Maryland	6	11	1	18
27½	Arkansas	2	7	6	15
27½	South Carolina	8	5	2	15
29	Florida	13	--	--	13
30	South Dakota	--	2	8	10
31	Alaska	1	3	5	9
32½	Hawaii	--	1	4	5
32½	New Hampshire	4	--	1	5
34½	Delaware	4	--	--	4
34½	Utah	--	4	--	4
36	Wyoming	3	--	--	3
37½	Minnesota	2	--	--	2
37½	Nebraska	1	1	--	2
	TOTALS	420	705	821	1,946

which extends through the early stages of adolescence." Alexander, Williams, Compton, Hines, and Prescott (1968) identify the following characteristics in human development during this period.

1. Differences in physical maturity levels with each sex and between sexes, as well as changes in physiological functioning, which are greater than those occurring at any other time during the growth cycle;

2. The gradual emergence of a more adult-like mode of intellectual functioning;

3. Psychological and social reorientation more traumatic than that of any similar period of growth.

The data from various studies corroborate the suggestion that children now begin the maturing process earlier (The Adolescent Growth Study of the University of California at Berkeley; the Harvard Growth Study by Shuttleworth; and other studies by Shuttleworth and Bayer and Bayley). These studies suggest that the puberty cycle is beginning earlier in children and as a result of these physiological changes and related demands of the cultural environment, a correspondingly earlier maturity comes in the social, emotional, and intellectual components of development (Read, 1969; Alexander, Williams, Compton, Hines, and Prescott, 1968).

The social and emotional development occurring during transescence takes several forms, including self-concept development, sex-role identification, peer influence, and turbulent emotions associated with the physiological changes. Wilfred P. Dacus, in a 1963 doctoral dissertation entitled, "A Study of Grade Organizational Structure of the Junior High School as Measured by Social Maturity, Emotional Maturity, Physical Maturity, and Opposite Sex Choices," showed that of pupils in grades 5 through 10 the differences in all these categories were <u>least</u> between pupils in grades 6 and 7 and grades 9 and 10 (Alexander and Williams, 1965).

Support for the related changes in intellectual development comes from the writings of Jean Piaget. Piaget's theory suggests intelligence is not fixed at birth but develops as the human organism interacts with the environment. Intellectual growth can be divided into three stages: the preoperational stage, the concrete operational stage, and formal thought.

The preoperational stage lasts until about age 6 or 7 and is characterized by a developing awareness of the external world. The concrete operational stage begins at 6 or 7 and continues to 11 or 12, during which time conceptions of the real world are expanded and ideas about the potential real world are extended. The formal thought stage is entered about age 11 or 12. The child begins to think in logical abstract terms. He can comprehend problems and hypothesize possible solutions. The entering of the formal thought stage corresponds to grades 5 or 6 (Read, 1969).

Thus, the middle-school concept is rationally and logically supported by evidence and must be given serious consideration by school districts analyzing their organizational structure. It is, therefore, important to remember that to date, there is little sound school research to support changing to a middle-school concept. This is undoubtedly due to the recentness of the movement toward middle schools and the nature of the research being conducted. Most research attempts comparisons between middle schools and traditional 6-3-3 organizational patterns. Middle schools tend to be favored not only because of concern with children at grades 5 and 6, but also because the ninth grade is moved to the senior high school level (see next section of this paper for rationale). School districts like North Clackamas School District, which already have four-year high schools, would theoretically have to be concerned only with early development problems at the fifth and sixth grade levels.

The Four-Year High School

In conjunction with the middle school movement has been the rejection of the three-year high school. The number of high schools beginning with grade 9 is increasing as the earlier maturation of students becomes more evident. A North Central Association survey (1971) showed that the number of three-year high schools is no longer increasing, while the number of four-year high schools has increased significantly in the past few years.

Like the middle school, the four-year high school is apparently a result of a changing school population in grades 5 through 9. The implication seems to be that since children are mature enough to leave the elementary school at grade 5 or 6, they are also mature enough to leave the middle school by grade 9. There is some support for the idea that ninth graders are more like high school students than seventh or eighth graders in terms of physical development, social and emotional growth, and intellectual development (Read, 1969). In the Dacus study cited earlier, these variables were used to show that pupils in grades 9 and 10 were more alike than pupils in grades 8 and 9. Finally, the significant changes which occur in social and emotional maturity between grades 7 and 9 are illustrated in Table 2.1 - 3 (Hansen, 1964).

It is not surprising, of course, that research findings and educators are not in total agreement on placement of the ninth grade. The Committee on Junior High School Education of the National Association for Secondary School Principals, for instance, recommends keeping grade 9 in the junior high school. In their report, "Recommended Grades or Years in Junior High or Middle Schools" (1967), they suggest that school systems base their organizational patterns on maturation patterns in the belief that most pupils are pubescent during grades 7 through 9. Strickland (1967) investigated

Table 2.1 - 3

SOCIAL AND EMOTIONAL DEVELOPMENT OF ADOLESCENTS

Aspects of Personality Grade 7--Age 12	Aspects of Personality Grade 9--Age 14.75
Variety and instability of interests	Narrowing and deepening of interests
Talkative, noisy, daring--a great deal of activity	More dignified, controlled masculine-feminine behavior
Seeking peer status with a high regard for peer standards	Mimicry of adult cultural patterns
Desire for identification with the herd	Identification with a more select group
Family status relatively unimportant in influencing peer relations	Family socio-economic status an increasingly important factor in peer relations
Informal social activities	Formal social activities
Dating present but rare	Steady dating not unusual
Emphasis on building relations with peers	Increasing concern with preparation for life
Friendships quite temporary	Lengthening friendships
Many friends	Selective friendships
Willingness to accept activities providing opportunities for social relations	Initiative in setting up own social relations and function
Little insight in behavior	Increasing insight
Acceptance of reasonable rules important	Making own code and standards with definite goals
Ambivalence in accepting adult authority	Growing independence from adults--dependence on self

two Florida schools and found that academic success of ninth graders was not determined by their placement in the school organization; he recommended retaining grade 9 in the junior high school.

2.2 Response of Students and Patrons

Student leaders and parent advisory board members in North Clackamas School District would apparently tend to support a conservative position in adopting new organizational patterns. When asked on a questionnaire, "Do you think the current age/grade organizational arrangement is satisfactory?", 81 percent of the students responded "Yes." Eighty-one percent also thought most people in the district agreed with them and were satisfied with the present organization. When asked for recommendations for changing the current organizational pattern, 66 percent of those responding said, "None;" 8 percent recommended a 6-3-3 plan; and 19 percent recommended a 5-3-4 plan. Advisory board members agreed. Only one parent suggested consideration of other patterns, a K-5, 6-8, 9-12 plan. Table 2.2 - 1 summarizes the data from the student questionnaires regarding vertical grade organization.

Table 2.2 - 1

RECOMMENDATIONS BY SELECTED STUDENT LEADERS FROM THE SECONDARY SCHOOLS OF NORTH CLACKAMAS SCHOOL DISTRICT REGARDING VERTICAL GRADE ORGANIZATION BY PERCENTAGES

Organizational Plan	(N=109)	Percentages
6-2-4		66-2/3%
5-3-4		19%
6-3-3		8%
Others		7%

Recommendations

A recommendation for the one vertical organizational plan that will best serve the North Clackamas School District is difficult to make. Recent trends in school organization favor nongraded systems, the middle school, and the four-year high school. Each trend is supported by sound educational theory and research.

Specific recommendations are difficult, however, because research does not conclusively support any one organizational plan over others. This is partly due to the nature of the research being conducted. Few studies are designed in a way which permits the findings to be generalized to other settings or communities. In addition, most researchers become aware of intervening variables which are difficult to control, but which may have significant effects on results.

Another complicating factor is the nature of these trends or movements--i.e., the trend toward middle schools, or the trend toward the four-year high school. The implication is that educators are finding these organizational plans the best method of providing quality education. This is not always the case. Many middle schools and four-year high schools are created because they seemed to represent the most economical way to utilize facilities or the most convenient way to solve other problems. Alexander (1968) argues that unless educational programs are coordinated with organizational plans, it will not really make much difference what plans are adopted. For instance, unless the educational program of the middle school is designed for the transescent youth and becomes something different than an advanced elementary school or a low-level junior high school, the only reason for adopting the plan should be convenience or economy. Thus, while the trends are real, reasons for the trends need to be analyzed and understood.

The alternatives presented below, therefore, are based on the best evidence available and the judgment of the staff in the Bureau, but they should be read with the understanding that the evidence is inconclusive.

Alternative #1. Consider the adoption of a middle-school concept. As all high schools of the district are currently operating as four-year schools, this should present few planning problems. Thus, this organizational plan can be illustrated K-5, 6-8, 9-12. A closely related modification of this plan would result in a K-4, 5-8, 9-12 plan.

The essence of this plan for North Clackamas School District is, of course, the middle school. District officials should monitor the development of this new concept, perhaps with special attention to the 5-8 school currently in operation. The middle school is supported by sound educational and psychological theory and may provide a more relevant educational experience for that particular age youth in addition to providing an easier transition into high school.

Alternative #2. Continue the current organizational plan of K-6, 7-8, 9-12. This plan deviates from Alternative #1 only in the placement of the sixth and/or fifth and sixth grades. It suggests continuing the four-year high school. The result is a two-year junior high school, a plan frequently criticized for being less efficient in terms of costs, for isolating a narrow age group of children, for not allowing students and teachers the opportunity to know each other as well (i.e., a 60% annual student turnover is usual), and for not providing an adequate transition into high school.

On the other hand, the K-6, 7-8, 9-12 pattern is fairly widespread and offers several benefits. Because it is widespread, it is more likely to accommodate a greater number of students transferring in and out

of the district. Also, it is the most common practice in the district and therefore offers the benefit of requiring the least amount of change. Finally, students and advisory board members tend to support this plan--an indication that it may be a successful way of organizing schools in the North Clackamas School District.

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SECTION 3

OPTIMUM SCHOOL SIZE

Introduction

This report represents recommendations regarding optimum school size for the North Clackamas School District in fulfillment of component 3.0 of the contract between the North Clackamas School District and the Bureau of Educational Research and Service. In developing these recommendations a review of the pertinent research and literature was conducted and information was gathered from the students and patrons of the school district. Bureau staff members met with student leaders in each of the junior and senior high schools and with parent advisory groups representing the school district population. At these meetings, discussions were held and information collected. Questionnaires were distributed to 150 students and 20 advisory group members soliciting information regarding vertical grade organization and school size. A total of 110 student questionnaires and 8 parent questionnaires were returned.

3.1 Review of Literature

Determining optimum school size has been a persistent problem for educational researchers. The assumption is that there is a relationship between school size and quality of education. Theoretically, the larger

school is able to offer a broader program of higher quality, but tends to lose the atmosphere of warmth and friendliness which allegedly characterizes small schools. Researchers continue to point out, however, that large schools do not necessarily provide more varied and higher quality programs and small schools are not necessarily more warm and friendly than large schools (Cashen, 1970; School Management, 1971; Turner and Thrasher, 1971).

The problem of determining optimum school size may be overemphasized. Typical of the sentiment in much of the recent literature on the question of school size is the following resolution adopted by the National Association of Elementary School Principals in 1966.

> For years many educators have believed that there is an optimum size for the elementary school and for individual classes. A number of recent developments--for example, improvements in school plant design, changing patterns of staff utilization, and major modifications in curriculum--provide alternatives which necessitate serious reconsideration of an inflexible position.

The implication is, of course, that there may not be an "optimum school size." The best a school district might accomplish is a set of guidelines and considerations to follow in constructing new facilities.

Schools could theoretically range in size from one student to all students in a given geographic area. Neither, of course, is practical or desirable. With the decisions made regarding the number of grades to be grouped in a building, the question is how many students of each grade level should attend the same school. For instance, if the school is to accommodate grades K-6, how many students of each grade level should attend a single building?

Criteria

Assuming a relationship between school size and quality of education, the problem occurs in choosing the criteria to measure the quality of

education. For instance, what is the best school size for insuring maximum student involvement in extracurricular activities? Or, what is the best school size for efficient operation--i.e., the best education in the most economical way?

The criteria identified below are commonly used in educational research. Some are more reliable than others.

Distance or transit time to school. This seems particularly important to young (K-3) elementary children. The American Association of School Administrators proposed the following guidelines.

	Walking distance	Travel time on bus
Elementary	3/4 of mile	1/2 hour
Junior High	1-1/2 miles	1 hour
Senior High	2 miles	1 hour

Per pupil expenditure. There is no doubt that it costs the same to employ a teacher whether he teaches five pupils or 25 pupils, but the use of per pupil expenditure as an indicator of quality is open to question. Per pupil expenditure is not really "cost," for instance, but a measure of the willingness of the community to finance education. Of the ten "top" high schools in 1968, as judged by a panel of experts, the range of per pupil expenditures was from $450 to $1,300, with the average being $852. Three had a per pupil expenditure of less than $655, the national average. (Educational Research Service, 1971) Finally, the formula for computing a per pupil expenditure is not standard. Indeed, the formula generally does not include capital improvement expenditures.

Pupil achievement. The number of contradictory studies, which use pupil achievement as a measure of quality education, is sufficient to justify the support of any size school (Cashen, 1970; School Management, 1971; Haesacker, 1970; Legget, et al., 1970; Gray, 1962, etc.) Only when this

criterion of a good school is used with several others does it have any credibility.

The educational program. The broad category called "the educational program" encompasses many specific criteria. For example, major course offerings may include such things as specializations in vocational education or special education. Obviously, the optimum school size of a vocational education school may be different from that of a special education school.

The curricular offerings are frequently measured in terms of the quantity of courses offered as an indicator of ideal school size, i.e., the more variety the better the school. Some researchers, however, have asked a different question--that is, What is the maximum number of students (or multiples thereof) which will provide the most curriculum offerings in terms of cost-effectiveness? Woods (1958) proposed 1,600 in four-year high schools; Mayo (1962) arrived at a figure of 2,000; Engelhardt, Engelhardt, and Leggett (1949), 3,000. Minimum suggested enrollments show even wider ranges. The above figures, of course, refer to high schools; researchers have indicated little concern with diversity of courses in elementary schools. (ERS, 1971)

Extracurricular activities. Research on the best size of a school as related to its extracurricular activities shows, generally, that the larger schools have more variety in their extracurricular activities, but that there is more student participation in small schools. In smaller schools the students tend to participate in a greater number of activities and a larger percentage of the student body is active in one or more extracurricular groups, according to Barker (1962) and Kleinert (1969). However, the investigators who have considered the effect of school size on the

extracurricular program, express different opinions on what constitutes the maximum size school to support a variety of activities plus a high degree of student participation. While Barker makes no recommendation, his study favors schools of less than 300 pupils. Kleinert's data support schools of no more than 1,500 pupils. (ERS, 1971) Brown (1956) sets a limit of 1,800 pupils.

Alternatives and Recent Trends

A review of the literature for the past 35 years leads to at least one conclusion. As the population has become urban, the size of schools has increased. Thus, in the past 20 years, recommendations for elementary schools with 1,200 students and high schools with up to 3,000 students have become common. Table 3.1 - 1 shows the guidelines some of the larger school systems have developed regarding school size.

As indicated, larger school systems build larger schools, and schools in the central city tend to be larger than suburban and rural schools. Table 3.1 - 2 shows the latest figures available on the average size of elementary and secondary public schools in the United States, by size of school system, metropolitan status, and region of the United States. Unfortunately, there are no recent figures on the number of schools of specific sizes in the United States. (ERS, 1971)

Senior high schools. Most of the recent research on school size deals with secondary schools, particularly senior high schools. But the criteria used are varied and ambiguous, the research results unclear, and the situations so different that few generalizations can be made. Recommendations regarding optimum size for four-year high schools range from 300 to 5,000 pupils.

Table 3.1 - 1

GUIDELINES DEVELOPED BY SOME LARGER LOCAL SCHOOL SYSTEMS ON THE SIZE OF SCHOOLS, 1970

School system and fall 1970 enrollment	Number of pupil or teachers to be accommodated in:			
	Elementary	Middle school	Junior high	Senior high
ATLANTA, GA. (105,119)	750	1000	---	1800
BALTIMORE COUNTY, MD. (Towson) (133,670)	600	1200	1200	1600
BUFFALO, N. Y. (70,098)	---	65 teachers	---	---
CHICAGO, ILL. (577,652)	1200 maximum	1500 maximum	---	2000-3500 maximum (depending on type)
DALLAS, TEXAS (160,230)	750-1000	1200-1500	1200-2000	2000-3500
DENVER, COLO. (95,754)	800	---	1500	2500
KANSAS CITY, MO. (70,726)	600	---	1200	1600
LOS ANGELES, CALIF. (642,895)	850	---	1900	2600
LOUISVILLE, KY., city schools (52,448)	30 teachers	50-60 teachers	---	60-80 teachers
MEMPHIS, TENN., city schools (144,147)	20 teachers	---	30 teachers	63 teachers
NORFOLK, VA. (56,503)	800-900	---	1200	2000
OMAHA, NEB. (62,000 est.)	560	---	1400	1400

Table 3.1 - 1 (cont.)

GUIDELINES DEVELOPED BY SOME LARGER LOCAL SCHOOL SYSTEMS ON THE SIZE OF SCHOOLS, 1970

School system and fall 1970 enrollment	Number of pupils or teachers to be accommodated in:			
	Elementary	Middle school	Junior high	Senior high
PITTSBURGH, PA. (72,924)	27-34 teachers (810-1020 pupils)	46-54 teachers (1380-1620 pupils)	---	82-100 teachers (2460-3000 pupils)
RICHMOND, VA. (45,245)	600-750	900-1200	900-1200	1000-1500
SAN ANTONIO, TEXAS (75, 262)	30 teachers	---	70 teachers	140 teachers
SAN DIEGO, CALIF. (130,386)	700	---	1500	2000
SEATTLE, WASH. (84,669)	450	---	1200	1500-1800
TULSA, OKLA. (77,737)	600-800	---	1000	1500-2000
WICHITA, KANS. (63,811)	600-1200	---	900-1400	1800-3000

SOURCE: Dade County Public Schools, Physical Plant Division. Instructional Equipment and School Plant Construction Survey of the Major School Systems Throughout the United States. Miami, Fla.: Public Schools (1410 N.E. 2nd Ave., 33132), September 1970. pp. 1-28. (ERS, 1971)

Table 3.1 - 2

AVERAGE NUMBER OF PUPILS PER SCHOOL, BY SYSTEM ENROLLMENT SIZE, METROPOLITAN STATUS, AND REGION, FALL 1968

Enrollment size, metropolitan status, and region of school systems	Average number of pupils enrolled in:		
	Elementary	Secondary	All schools
System enrollment size:			
25,000 and over	647	1,440	818
10,000 - 24,999	482	1,120	611
5,000 - 9,999	450	1,086	569
2,500 - 4,999	386	824	471
300 - 2,499	313	346	319
Under 300	64	88	68
Metropolitan status:			
Metropolitan, central	600	1,441	778
Metropolitan, other	486	942	588
Nonmetropolitan	279	464	319
Region:			
North Atlantic	452	1,103	578
Great Lakes and Plains	339	616	407
Southeast	449	791	508
West and Southwest	405	670	472
Average enrollment, all schools	401	751	479

NOTE: Average for elementary schools and secondary schools columns are slightly exaggerated because the calculations include pupils in, but not the number of, combined elementary and secondary schools.

SOURCE: U.S. Department of Health, Education, and Welfare, Office of Education. Statistics of Local Public School Systems--Schools, Pupils, and Staff, Fall 1968. Washington, D.C.: Government Printing Office, 1970, p. 16 (ERS, 1971).

However, there appear to be two relatively stable criteria with regard to optimum high school size--the proportion of students involved in co-curricular activities and the cost effectiveness of operating the school. A recent article by Turner and Thrasher (1970) seems to verify and summarize others, (Smith, 1960; Kleinert, 1964), who have identified similar

optimum high school size using these two key criteria. Turner and Thrasher suggest that the rationale for extremely large high schools rests on two assumptions--a large high school can offer broader educational programs, and costs per pupil are smaller. Both assumptions are faulty. Findings of Turner and Thrasher demonstrate that many small schools match the curriculum offerings of schools with 3,000 pupils and that the decrease in costs per pupil are minimal as enrollment exceeds 1,000. The study concludes that in terms of combining educational and co-curricular opportunities with program effectiveness, optimum school size for four-year high schools appears to be in the range of 700 to 1,200 students.

Junior highs or middle schools. Sizes of the junior high school or the middle school seem to fluctuate as much as senior high sizes. If the school is in an urban area, it tends to be large--i.e., 1,200 students or more. If the school is located in a suburban or rural area, it tends to be smaller--i.e., 300-500 students or less. In general, the variables used as criteria for high school size are used for junior high schools, but the research is much more sparse.

The size of the junior high or the middle school will obviously be affected by the number of grade levels included. Generally, the school must be large enough to offer a varied academic and extracurricular program, but small enough to allow for maximum student participation. Researchers generally concur, however, in suggesting that junior highs or middle schools be smaller than high schools, but larger than elementary schools. This seems to be logical given the function they serve as transition institutions.

Recommendations in the literature range from 245 through 1,400 pupils. (ERS, 1971) While the research is not conclusive, loose guidelines

might suggest 400 to 800 pupils, depending on the number of grade levels included.

Elementary schools. Research dealing with elementary school size is sparse compared to secondary school research, yet the researchers utilize more varied criteria in the search for optimum school size. Security, the need for more personal attention, and transit time to and from school are used to argue for smaller schools; while more flexibility in grouping, flexibility in dealing with individual needs, opportunities for inservice training, and support services are used to argue for larger schools.

The actual size of elementary schools will obviously vary with the number of grade levels included in each school, but it is generally not recommended to have fewer than two sections of each grade level per building. Administrative and instructional support, student services, and extra programs for children become more difficult to arrange as the number of children decreases. Efficiency is lost and benefits to students suffer.

There is more of a consensus of opinion regarding the best size for elementary schools than for middle or secondary schools, perhaps because of the sparsity of research. The alternative recommendations are less varied. Of 14 studies conducted in the past 20 years, only one study recommended a minimum size of less than 300 pupils and only one more than 800. The general consensus was 400 to 800 students. (ERS, 1971)

3.2 Responses of Students and Patrons

The secondary school students and advisory board members contacted in the North Clackamas School District tend to support the tentative guidelines suggested here regarding school size. Sixty percent of the

students responding to a questionnaire (North Clackamas Student Ouestionnaire) recommended that elementary schools (K-6) house from 400 to 600 pupils (Table 3.2 - 1).

Table 3.2 - 1

RECOMMENDATIONS BY ELECTED STUDENT LEADERS FROM THE SECONDARY SCHOOLS OF NORTH CLACKAMAS SCHOOL DISTRICT REGARDING ELEMENTARY SCHOOL SIZE BY PERCENTAGES

Number of Pupils	(N = 72)	Percentage
200 - 300		5%
300 - 400		16%
400 - 600		60%
600 - 800		11%
800 +		8%

Thirty-six percent of the students recommended the junior high or middle schools have 300 to 400 pupils. Another 45 percent recommended 400 to 800 pupils for these schools (Table 3.2 - 2).

Table 3.2 - 2

RECOMMENDATIONS BY ELECTED STUDENT LEADERS FROM THE SECONDARY SCHOOLS OF NORTH CLACKAMAS SCHOOL DISTRICT REGARDING JUNIOR HIGH AND MIDDLE SCHOOL SIZE BY PERCENTAGES

Number of Pupils	(N = 65)	Percentage
200 - 300		15%
300 - 400		36%
400 - 600		30%
600 - 800		15%
800 +		4%

It is important to recognize that students were recommending these sizes based upon a two-year junior high school, not a three- or four-year junior high or middle school.

Finally, 44 percent of the students responding recommended 1,200 to 1,400 pupils for the high schools (9-12), while another 28 percent recommended from 1,000 to 1,200 pupils (Table 3.2 - 3).

Table 3.2 - 3

RECOMMENDATIONS BY ELECTED STUDENT LEADERS FROM THE SECONDARY SCHOOLS OF NORTH CLACKAMAS SCHOOL DISTRICT REGARDING SENIOR HIGH SCHOOL SIZE BY PERCENTAGES

Number of Pupils	(N = 65)	Percentage
500 - 1,000		18%
1,000 - 1,200		28%
1,200 - 1,400		44%
1,400 - 1,800		10%

Parent advisory board members apparently would also support these guidelines. In discussions at advisory board meetings and on a questionnaire, parents expressed satisfaction with the size of existing schools. For elementary schools, six of the eight responding on the questionnaire recommended 300 to 600 students. For junior high or middle schools, parents suggested 400-800 students and for high schools, 1,000-1,600 students.

Recommendations

Identifying an optimum size for the schools in North Clackamas School District is difficult because of the nature of the research that has been

conducted. The criteria used to determine the ideal size are inconsistent and unstable. What proves to be an important criterion in one study is frequently insignificant in another study. Even when similar criteria prove to be significant variables in different studies, the results are often contradictory. The result is that the research literature proves to be neither specific nor conclusive.

As mentioned above, however, specific policies regarding the optimum school size may not be as important as previously thought. Taking into consideration recent educational innovations in plant design, staff utilization, scheduling, curriculum design, etc., a school district may need no more than broad policy guidelines regarding the size of schools. The recommendations which follow, therefore, are supported by recent studies, the students and advisory board members of North Clackamas School District, and the judgment of the staff of the Bureau, but they probably do not justify the adoption of any inflexible position with regard to the number of students per building.

Elementary

The recommended size for elementary schools may vary depending on the vertical grade organization. A K-6 school may be larger than a K-4 school. A minimum of two sections per grade level is a generally accepted guideline. If a student teacher ratio of 25 to 1 is used, this would result in a minimum of 350 students in a K-6 school. In the judgment of the Bureau staff, elementary schools with 400 to 600 students are probably the most acceptable in terms of providing support services for instructors and pupils. It appears that little is gained by having elementary schools much larger than 800 students and much might be lost in terms of individual student recognition.

Junior High or Middle School

Again, the actual recommended size may be influenced by the number of grade levels included in the schools. Generally, schools should be large enough to meet the extracurricular and academic needs of the students, but small enough to encourage individual utilization of staff and resources. Too, the junior high or middle school should be slightly larger than elementary schools, but smaller than senior high schools. On the basis of these guidelines, recommendations of 500 to 1,000 could be supported for three- or four-year schools. For two-year schools, i.e., seventh and eighth grade, recommended sizes might more appropriately be 400 to 800. These recommendations are supported by students and patrons of the school district.

Senior High School

Four-year senior high schools are usually larger than elementary or junior high schools. This is generally acceptable for efficiency purposes and because larger schools are more readily able to meet the needs of this age group.

Optimum size for senior high schools is probably between 700 and 1,200 students. Using the two key criteria of ability to provide for extracurricular activities and program effectiveness, these figures appear to be the most supportable. Students and patrons in the district would suggest the high schools are acceptable at their present size--i.e., 1,200 to 1,500 students. It would be difficult to argue conclusively for the smaller school position. Certainly, the existing facilities should be utilized to the greatest degree possible. All other things equal, long-range planning should probably include consideration of smaller schools when new facilities are to be constructed.

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SECTIONS 4 AND 5

ANALYSIS OF ATTENDANCE AREAS

The original request for a proposal from which the present contract was developed listed the following two sections among the six general tasks to be performed by the contractor:

4.0 To obtain recommendations regarding the size, number, location of all schools existing and projected for a period of twenty years;

5.0 To obtain recommendations regarding attendance area designations for each of the schools.

The final version of the contract combined these tasks into a single section, but the original numbering was retained for ease of reference. The contract states:

4.0 and 5.0 Prepare recommendations regarding size, number, general location and attendance area designations for existing and projected schools for the period 1972-1992. The study will:

4.1 Review and analyze data generated in 1.0, 2.0, and 3.0.

4.2 (a) Develop a computer model for examining various attendance boundaries, or

(b) Prepare by hand visual representations of recommended attendance boundaries.

This section of the report discusses the immediate application of the data generated under Section 1. The long-term implications are discussed in Section 7.

Data Sources

Three data sources were utilized in setting up a procedure for analyzing attendance boundary alternatives:

1. The 1970 U. S. Census data are organized by census tracts, block groups, and blocks. The specificity of the data varies by organizational unit. In particular, at the block level the population age distribution is available only by certain age groupings: 0-4, 5, 6-9, 10-13, 14, 15-17, and 18-19. At the tract level, however, the distribution is available by single-year increments.

2. School census figures were available for October, 1970. These included children 4 through 19 years old. Comparison of school census data and U. S. Census data showed that there was satisfactory agreement, except that the school census information on 4- and 5-year-olds was incomplete.

3. Since school and U. S. Census figures were based on age, it seemed desirable to use a third data source based on the grade-level distribution of children in school. Comparisons of the three data sources were carried out. An important finding was that enrollment by 12 one-year age categories gave substantially the same district-wide figures as classification by grades. It was concluded, therefore, that treatment of enrollment data by age categories rather than by grade categories was justified. The current enrollment data were used to produce plots of the present distribution of students by census blocks.

Assignment of Data to U. S. Census Blocks

As has already been pointed out, U. S. Census data are summarized on a variety of bases. However, school census and school enrollment records

are based on addresses. In order to make the sources compatible, it was necessary to process the school census and school enrollment data by means of an address-matching program. This program assigns each record to a U. S. Census block according to its address.

Several problems arose in the course of this procedure. It was necessary to impose some arbitrary definitions on rural route designations; consequently, all records on a given rural route were assigned to an arbitrary point somewhere in the general area served by that rural route. Two or three errors in the address-matching program were encountered, but manual assignment was carried out wherever possible. Manual assignment was also used in place of automatic assignment in cases where there were obvious errors--such as misspelling--in the address associated with individual records. Inevitably, in a number of cases no assignment was possible because of a missing address or an unresolvable address anomaly.

Merging Data Sources

Since there was a close correspondence between U. S. Census and school census data for the age categories 6-18, it was decided to base the main data file on school census data because it was available in finer age classifications at the block level. However, since 4- and 5-year-olds were clearly under-enumerated by the school age census, and since the school age census did not include children less than 4 years old, it was decided to merge U. S. Census figures for children up to 5 years old with the figures for 6- to 18-year-olds from the school census.

Two options were available in the treatment of U. S. Census data. Single-age categories could be obtained for each census tract, and it could be assumed that the children were distributed throughout the blocks within each

tract in proportion to the number of children in each block. Alternatively, block data could be used. Since block data are available for 5-year-olds and for children less than 5 as a group, this alternative requires the assumption that there is an equal distribution of children in the five age categories (ages zero through 4) within each block. The second alternative was chosen.

The main data file, by which attendance alternatives were evaluated, was therefore made up of U. S. Census data for ages zero through age 5, and school census data for ages 6 through 17.

The Model of the School District

The purpose of summarizing the school age population by U. S. Census blocks was to make possible a comparison of attendance areas formed by different combinations of census blocks. However, since there were some 500 census blocks within the school district, some consolidation seemed necessary. The census blocks were collapsed into 73 larger units, using the following criteria:

1. As far as possible, existing school attendance boundaries should be definable in terms of the units.

2. If possible, census blocks should not be split between two units.

3. Natural boundaries--such as through streets, railroad lines, and features of the terrain--should not be violated.

4. At critical points, particularly where adjacent schools were very close to each other, the units should be small enough to provide for fine boundary variation.

The 73 units thus derived were numbered systematically. The first three digits of the five-digit number indicate the U. S. Census tract in which the

unit is located. In one or two cases, during later modification of the units, this convention was not strictly adhered to.

The Interactive Manipulation Program

In order to permit easy and rapid manipulation of the data, an interactive computer version of the school district model was developed. The procedure involved easy transfer of attendance units from one school to another and permitted immediate calculation of enrollments for schools so that the effect of the changes could be observed.

The computer program utilizes two data files. The first is the master data file already referred to--the file that contains a summary of school-age children by single-year age categories for each attendance "unit"; the second is a file that gives the initial assignment of these units to the schools in the district. Each unit is assigned to one elementary, one junior high, and one senior high school.

Features of the program. The computer program has the following capabilities:

1. To print a summary of the current allocation of attendance "units" to schools;

2. To search for the schools with which a specified unit is presently associated;

3. To change the age definition of children attending a given type of school;

4. To print out 5-year enrollment summaries; and

5. To transfer units from one school to another.

The potential of the program. The program could be modified to include the following features:

1. Incorporation of growth factors by census tract so that future enrollment estimates reflect certain growth assumptions;

2. Inclusion of a data file containing school capacity estimates so that school capacities could be printed at the same time as enrollment forecasts in order to permit easy comparisons between capacity and projected attendance.

Optimization Procedure

In slow stages, boundary lines were manipulated until a solution was obtained that was feasible in terms of elementary school capacities. Then the additional constraint was imposed that each elementary school should feed into a single junior high school. Further manipulation generated a feasible solution. However, by this time, some modification of the original attendance "units" had become necessary. But in only one case did a U. S. Census block need to be divided between two adjacent units.

By using U. S. Census blocks as the basic components of the attendance units, some artificiality was inevitably built into the model. However, it is clearly not necessary to observe census block boundaries precisely in finalizing attendance boundaries. The model permits easy comparisons of alternatives in rather gross terms, but the last stage of decision-making--the actual definition of the dividing line between schools--must remain an administrative task based on knowledge of local conditions.

Provision for Further Use of the Procedure

The following documents have been supplied to the North Clackamas School District:

1. A print-out of the school-age population by the arbitrary attendance units based on:

(a) The school district census figures (1970) for children aged 6-18;

(b) U. S. Census block data (1970) for ages 0-5. It is assumed that for ages 0-4 children are equally distributed throughout the age categories within a given attendance unit;

2. A map of the arbitrary attendance units developed from U. S. Census blocks;

3. A print-out of the census block components in each attendance unit;

4. Suggested attendance areas for existing schools. These are given in two forms:

(a) A listing of the units assigned to each school;

(b) Separate maps for elementary, junior high, and senior high attendance areas;

5. Estimated attendance figures (1972-73 to 1976-77) by schools for the suggested attendance areas. These figures are based on 1970 data and do not include estimates of growth or population shifts since then.

6. Estimated kindergarten enrollment figures, by schools, for 1972-73.

7. Estimated ninth-grade enrollment figures for modified senior high attendance areas--to help with decision-making regarding the senior high attendance boundaries during the transition period from old to new boundaries.

The district could choose one of the following alternatives if a systematic updating of this procedure is desired:

1. It could develop a coding system for enrollment and school census records whereby each child's location is pinpointed in terms of one of the arbitrary attendance areas. Summaries could then be made periodically of children by age groups within each unit. In this way, school population shifts could be analyzed and necessary attendance boundary modifications made.

2. The district could periodically retain an outside agency to process enrollment and census data by means of an address-matching program that assigns individuals to census blocks. The census blocks would be aggregated into arbitrary units such as were developed under the present contract. Analysis and adjustment could then be carried out.

In either case, it would be desirable to conduct a regular district-wide census, especially of pre-school children. In addition, it would be desirable to develop a mapping procedure for the eastern part of the school district to complement the U. S. Census system of blocks. Such a procedure would permit more accurate description of student distribution in this area.

Comparison of Data Sources

In the later stages of the study, data on current enrollments for grades 1-8 became available. It was decided to carry out some comparisons of the data sources as well as to use the more recent data for displays of information. Plots of the distribution of public school students by U. S. Census block were prepared for each of the grades 2 through 8 for the 1972-73 school year. They were made available to the district in the form of semi-transparent overlays that could be superimposed on standard U. S. Census maps of the North Clackamas area. The grade designations of individuals for the next school year were obtained by simply advancing their current grade classification one year. On the basis of current enrollment data, student lists were prepared by grade for each of the elementary and junior high schools in terms of the proposed attendance areas for the 1972-73 school year. A number of the student addresses could not be assigned to schools because of anomalies that prevented their being processed by the address-matching program.

Age-grade comparisons using enrollment data. By use of 1972 enrollment data for grades 1-6, a number of comparisons were carried out to examine the assumption that age is an adequate indicator of grade level. It was found that in terms of total enrollment in the school district, the total number of children in a given grade could be predicted with reasonable accuracy since grades tended to be similar in size and the distribution of children by age within a grade tended to follow a definite pattern.[1] When individual tracts were examined, however, some major discrepancies appeared, although the general correspondence was remarkably high.

While the assumption of age-grade equivalence gives an adequate picture of the grade distribution of children in the district as a whole, it almost certainly does not give sufficient accuracy by smaller units of analysis to warrant its use for any purpose requiring precise prediction. For example, the prediction of enrollment in individual grades in each school is at best a precarious undertaking using age-based data. It is therefore recommended that, as long as district schools are organized along clearly defined grade lines, grade-based data rather than age-based data should be used for attendance boundary decision-making.

Comparison of census and enrollment data. In the two years between the collection of the two sets of data, there appears to have been a shift from west to east. This does not necessarily mean that families have migrated from west to east. Rather, it suggests that the recent downward trend in the number of children produced by a given neighborhood has been offset in the east by new settlement. Consequently, the enrollment estimates--

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[1]For example, the ratio of 6-year-olds to 7-year-olds to 8-year-olds in the first grade was 55:40:5. For the other grades (grades 2 through 6) the ratios for the equivalent ages were 60:36:4, 59:37:4, 61:36:2, and 63:34:3, respectively.

which were based on 1970 figures--may not be accurate for all parts of the school district. In particular, a comparison of census data with enrollment data suggests that elementary schools in the west may have fewer children than anticipated, while schools in the east may have more.

In order to overcome the problem, attendance area boundaries could be modified so as to enlarge boundaries in the west and reduce them in the east. However, such a procedure might be expected to produce some awkward attendance areas. Later in this report it is recommended that the district should consider a gradual shift to a K-5, 6-8, 9-12 grade organization. Consideration could be given to reducing the pressure on elementary facilities in the eastern part of the district by beginning a shift to K-5 operation of elementary schools. As many sixth grade students as possible could be accommodated in Ickes Junior High School. The proximity of Ickes and Harmony Elementary School encourages flexible utilization of these two facilities. In addition, the introduction of the sixth grade at Ickes would give the district an opportunity to analyze the sort of program adjustments that are needed in association with such an organizational change. Rowe Junior High School could also be operated as a 6-8 school at an early date.

SECTION 6

COST IMPACT OF ESTABLISHING KINDERGARTENS

Introduction

The public kindergarten, according to U.S. Office of Education surveys, is a well-established institution in the public schools of the country. However, there is some question about its status in the state of Oregon. According to Miss Jean Spaulding, Oregon State Department Specialist in Primary Education, there are kindergartens in only about 91 districts of the state. Research indicates that a great deal of effort is required on the part of local districts to surmount the hurdles of cost, legislative action, and lack of concern on the part of the general public to originate such programs.

The North Clackamas School District should be commended for exploring the possibility of establishing kindergartens for all children in its district.

One of the most important considerations for educational improvement is to give priority to instruction in the preschool and primary grades, and this North Clackamas is striving to do.

A statement made by Gardner Cowles in 1956 at the National School Boards Association points out:

> "The younger the human being, the more effective and lasting will be any effort to teach him. The educational influence that may be exerted on a five-year-old in one hour's time takes tens, hundreds, or even thousands of hours at 18."

Basic Considerations Affecting Costs

The cost of establishing kindergartens in a school district depends upon many local factors--availability of space and sites, costs of construction or remodeling, cost of equipment and maintenance, and teachers' salaries. Furthermore, the district may wish to consider several options, in light of the immediacy or urgency of the program and the feasibility of adopting temporary arrangements and/or making long-range plans.

For these reasons, three different alternatives are recommended as possible approaches in establishing a kindergarten instructional program in the North Clackamas district:

> Alternative #1. Utilization of present, available facilities remodeled for kindergarten use;
>
> Alternative #2. New building construction equipped for kindergarten use;
>
> Alternative #3. Purchase of relocatable housing--portable, mobile, divisible, and demountable--equipped for kindergarten use.

Cost estimates are made by projecting initial costs (as available), cost of equipment, salaries, supplies, and operational expenses.

Recommended Class Size and Space

Two basic factors must first be considered--recommended class size and recommended space for instruction of kindergarten children.

Recommended Class Size

The Association for Childhood Education International[1] recommends classes of 20 people, with a class range of from 18-25 children. On the

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[1]Lorraine Sherer, How Good Is Our Kindergarten, Association for Childhood Education International, Washington, D.C., 1959.

basis of age levels, specialists have recommended one teacher for each group of 20 to 25 children at the five-year-old level. If the class size exceeds this figure, the teacher has less time for attention to individual pupils, for contacts with parents, and for the preparation of instructional materials. When classes are large, the children often have too little space for their activities and materials. Without favorable classroom conditions there is little chance that the unique methods of kindergarten will be used effectively.

Recommended Space

Kindergartens seek to provide special physical facilities for children. Recommended floor space per child ranges from 35 to 50 square feet; outdoor space for free play, 75 to 100 square feet. Other requirements include toilet and locker spaces, pre-tested equipment and supplies, display boards and storage areas.

Jean Spaulding of the Oregon State Department, specialist in Early Childhood Education, recommends a floor space of 1200 square feet per classroom of 18 to 25 children (about 50 square feet per child for a class of 25).

An NEA publication on Kindergarten Practices (1961)[2] suggests that the median space in public school kindergarten classrooms for 24 to 28 children is 967 square feet, which is relatively close to the minimum space allotment recommended by the Association for Childhood Education International. However, if a school district is starting a program with new facilities, the 1200 square foot recommendation of Miss Spaulding should be carefully considered.

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[2] Kindergarten Practices, 1961, NEA Research Division, 1962, p. 10.

Three Alternatives

#1 Use of Present Available Facilities

In the NEA survey of 1961[3] it was found that about 80 percent of the public kindergartens were housed in typical elementary school buildings. A separate building on elementary school grounds was utilized by about 13 percent, and a separate building not on the school grounds by about 6 percent.

Temporary facilities. Seven percent of the kindergarten rooms in public kindergartens were makeshift arrangements, sometimes in basements or halls. A room designed as a regular classroom served the kindergarten in 21.7 percent of the cases. Some 71 percent of the public kindergarten rooms were designed specifically for kindergarten use.

The use of rooms found in churches, old buildings, and other areas of the community has become one of the ways to get a kindergarten class started. This alternative is a possibility suggested by the Oregon State Board of Education and has its approval. However, the Board suggests that a thorough analysis be made to determine adaptability, safety, and costs and that the underlying policies and future plans be clearly articulated in advance.

One community[4] solved the problem of providing temporary kindergarten facilities by building six residential units--complete with fireplace, bathroom and kitchen equipment, but minus interior partitions. The rooms have fluorescent lighting, chalkboard, and tackboard and are carpeted throughout. When the district is ready to provide other, permanent housing for the kindergarten children, it will be comparatively easy to

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[3] Ibid.

[4] Edina, Minnesota. See Nation's Schools, May 1969, p. 120.

convert the present structures to residential units by installing interior walls. Cost of the six houses was some $215,000. The district expects to recover the entire cost of the units.

Existing classrooms which are, or may soon become, available for kindergarten use could be remodeled as temporary facilities provided they are located in appropriate areas and are convertible to kindergarten standards. Convenient accessibility of the area is another consideration; its flexibility for scaled-down equipment (such as toilet equipment) is another.

The Educational Facilities Laboratory states that a short-term investment, using low-cost buildings and rooms, can sometimes provide more immediate shelter and a higher quality of housing for a lower initial capital outlay than a permanent structure though this is not always the case. It is usually felt that the quality of educational utility and structure is generally lower in temporary housing than in a permanent facility. The relatively higher maintenance needs of structures built by lower standards results in higher costs over a long period of time than is the case with quality, permanent construction.

In Table 6 - 1 (page 154) it will be seen that no attempt is made to estimate the cost of remodeling any present facilities for temporary kindergarten use. Construction costs are too dependent upon local construction bids, costs of materials, and the size and condition of facilities selected for kindergarten use. Also the time lag between planning and construction would tend to invalidate any specific cost estimates.

#2 New Construction

A number of factors will need to be considered in case new, permanent construction for kindergarten use is anticipated. Providing a pleasant

learning environment for youngsters is nowhere more important than when very young children have their first contact with school.

The kindergarten (of a design scaled to primary children) should be located on the ground floor and, if this is part of a larger structure, should be easily accessible by separate entrance. It is desirable to provide direct access to a fenced playground area especially set aside for the children's use. There is need for abundant natural light within the building and for good thermal-control--preferably electrically heated floors or panel (radiant) heating, as well as plenty of floor space, ample storage room, and special sinks and toilet facilities.

In order that a variety of activities may be served in the instructional program, provision for freedom of movement and flexibility of arrangement is an important keynote in kindergarten planning. Spaces and features to be kept in mind include the following (scaled down to primary-age size): work area (with benches, cabinets, sinks, storage); art center (with wall easels, waterproof-topped table, storage for large sheets, etc.); science and nature center; library corner or alcove (with low bookshelves); teacher's corner (with closet); kitchenette (with sink and cupboard); tackboards, chalkboards, electric outlets, room-darkening shades, etc.; and the main activity area (which may also be used as resting area).[5]

The outdoor, fenced playground should have wet-weather surfacing, apparatus area, and storage space for play equipment and tools. A drinking fountain is desirable, as are trees and shrubs.

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[5]It would be particularly desirable to include an adjoining multi-purpose room which could be used as a play area on rainy days. An attractive arrangement of this kind is provided in the Nell Hoyt Primary School in Tacoma, Washington, (Architect, Robert Billbrough Price).

Costs of new construction are estimated to be $20.00 per square foot at a minimum (see Table 6 - 1 for high and low estimates). They will, of course, vary according to local bidding standards.[6]

#3 Relocatable Housing

Relocatable structures for expansion of the school program or for accommodation of larger school population have become an attractive alternative in many school districts. A 1968 opinion poll[7] indicated that 35 percent of the districts polled across the nation had at least one facility of this type and that 70 percent of the others would consider such a purchase. The figure is undoubtedly higher today in light of the more adequate units now available. Whether as a temporary or as a permanent arrangement, such an alternative is worth exploring.

When dealing with relocatable structures, one must consider not one type but four types of building--namely, portable, mobile, divisible relocatable, or demountable. No matter what name is applied to relocatable structures, they normally fall into one of the four categories. The categories reflect the method by which the structure is moved, and certain physical characteristics of the building.

Following is a description of each type of building, its general advantages and disadvantages, and a diagram of each.[8]

Portable facilities. This relates to a structure which is moved as a whole from one site to another. It may be a single or a double classroom.

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[6]The Tacoma School, built about five years ago, is a four-classroom structure accomodating 120 kindergarteners and first-graders. Its cost per pupil was $820 or $10.66 per square foot.

[7]See "Schoolmen Warm Up to Relocatable Classrooms," Nation's Schools, November 1968, page 70.

[8]Relocatable School Facilities, Educational Facilities Laboratories, Inc., New York, 1964.

The techniques of transport are similar to those used for house moving.

The width, length, and height dimensions are restricted by the logistics of access to and from the site. Experience suggests that the maximum feasible width for a portable building is 26'-28'; the maximum length, 68'-72'. The maximum road to roof peak clearance is considered to be 13'-13'6".

Because of regulations pertaining to height, most portables are built so that they have an interior floor-to-ceiling height of 8'-9'6", achieved by having flat-roofed or low-peaked design.

There is also stress and strain of future moves to be considered along with possible limits to the moving distance. This suggests a check with the Bureau of Traffic Codes.

The portable structure, and the manner of towing it, are depicted in Figure 6 - 1.

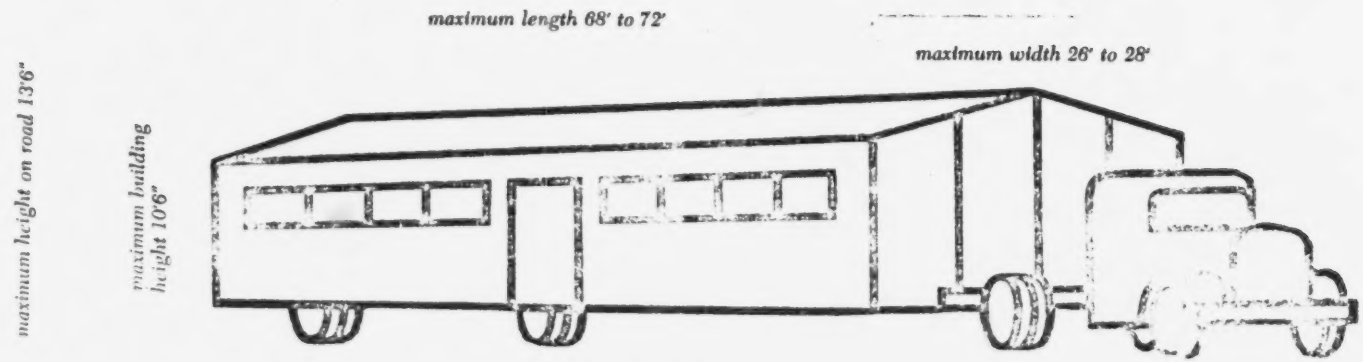
Mobile facilities. The mobile structure is designed along the patterns used for mobile (trailer) homes, buses, or truck construction. A great deal of technological know-how has been utilized in the mass production of this design, with space, mobility, and roadability uppermost in mind.

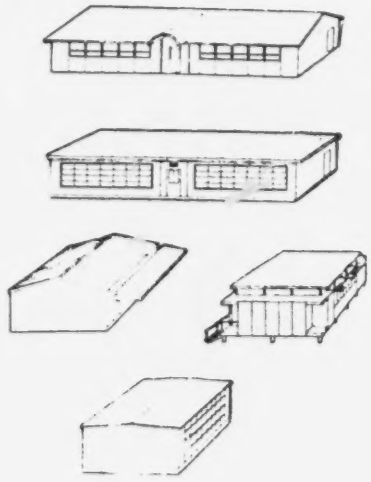
Some schools have adapted long, narrow trailers to use as mobile demonstration centers, rolling laboratories, and other special facilities. This unit has the distinction of being the most easily moved of the relocatables currently in use. However, its narrow proportions are basically not suitable for normal classroom use.

The mobile unit is planned for greatest ease of transport without special permits, the width dimension normally not exceeding 10'. The maximum feasible unit length does not usually exceed 65'-70'. Most

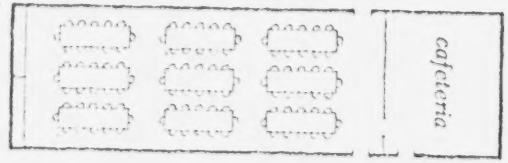
Figure 6 - 1

PORTABLE FACILITIES

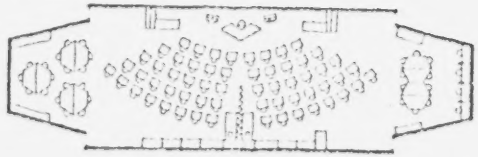




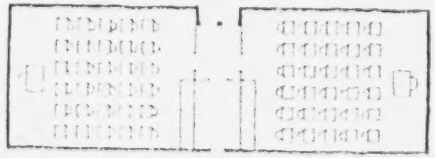
Oversize special, library-cafeteria



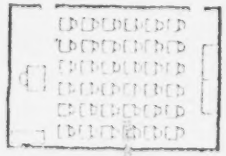
Double unit, classrooms



Double unit, divisible classrooms



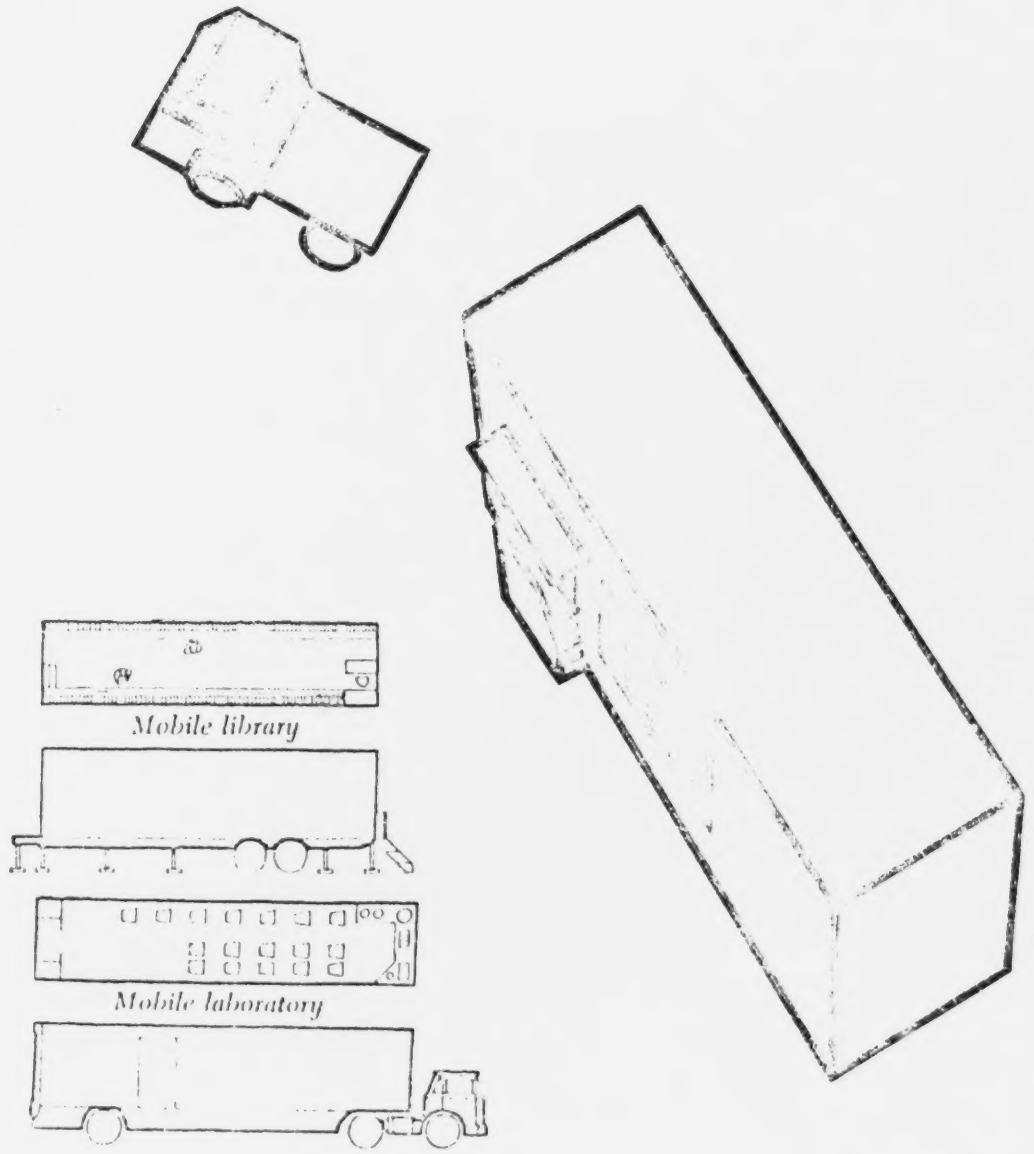
Single unit, classroom



Single unit, rest rooms

Figure 6 - 2

MOBILE FACILITIES



manufacturers recommend 60' as a maximum length for greater ease in handling and cornering.

A steel carriage is standard to the mobile structure. The pulling hitch, axle, and wheels can be permanent or removable. There is some talk of developing divisible units rather than using the single-width unit. One other advantage that might be important is the flexibility inherent in the framing system of the mobile units which obviates the need for heavy foundations.

The mobile structure, and the manner of moving it, are depicted in Figure 6 - 2.

Divisible facilities. The term "divisible" refers to buildings planned to fit together and come apart as large, modular building components. Bricks are small building modules; but divisible structures take the concept of modularity several steps further until the components include windows, doors, and entire sidewalls, roof, flooring, and utilities--all combined and pre-finished for greatest ease of shipping and rapid assembly at a given site.

This unit falls into the category that is used as a standard mobile-home unit which is a segment of a larger building. The total width normally is 20' (two halves), which is less than the 24' minimum that should be provided as space for 30-35 students. This, however, does not obviate the usefulness of the unit. Three 56'-long sections (the center unit open on both sides) can be and have been combined to provide double classrooms, each 26'-30' in length.

For the greatest ease of transport, divisible unit sections are normally restricted to modules 8'-10' in width. The length span of such units depends on the engineering capability of the designers and normally

ranges from 24'-36'. The road-to-roof-peak height limit is 13'-13'6" in transport, which is common to all units designed to be moved. The building height is usually limited to 10'-11'; however, the length and interior space layouts are unlimited.

This design has been thought to hold the greatest potential for a variety of uses and is currently used in both relocatables and permanent school facilities. The divisible structure, and the manner of transport, are depicted in Figure 6 - 3.

Demountable facilities. This type of building is defined as a building which can be disassembled and moved to a new site with a comparatively high recovery of building components. Its basic structure is based on the panel system. Components are usually factory made (such as curtain wall modules), assembled at the site, and moved later in still larger sections. The floor may be planned as recoverable and moved with the structure or (as in a poured slab) it may be considered expendable. A broad range of structural systems is employed in demountable buildings, the curtain wall system being the most common.

Of the four types of relocatable facilities, the demountable is the slowest and most costly to move. Its advantage lies in the complete freedom of design and space accommodations possible, with no limits as to height, length, or width except those imposed by the engineering scheme. As the cost is higher, it is recommended that this type of structure be looked at for a more long-term installation.

Buildings of almost any size, shape, or complexity can be planned following almost any system of demountable component structures. The demountable structure could look like Figure 6 - 4 and could be moved in any feasible manner.

Figure 6 - 3

DIVISIBLE FACILITIES

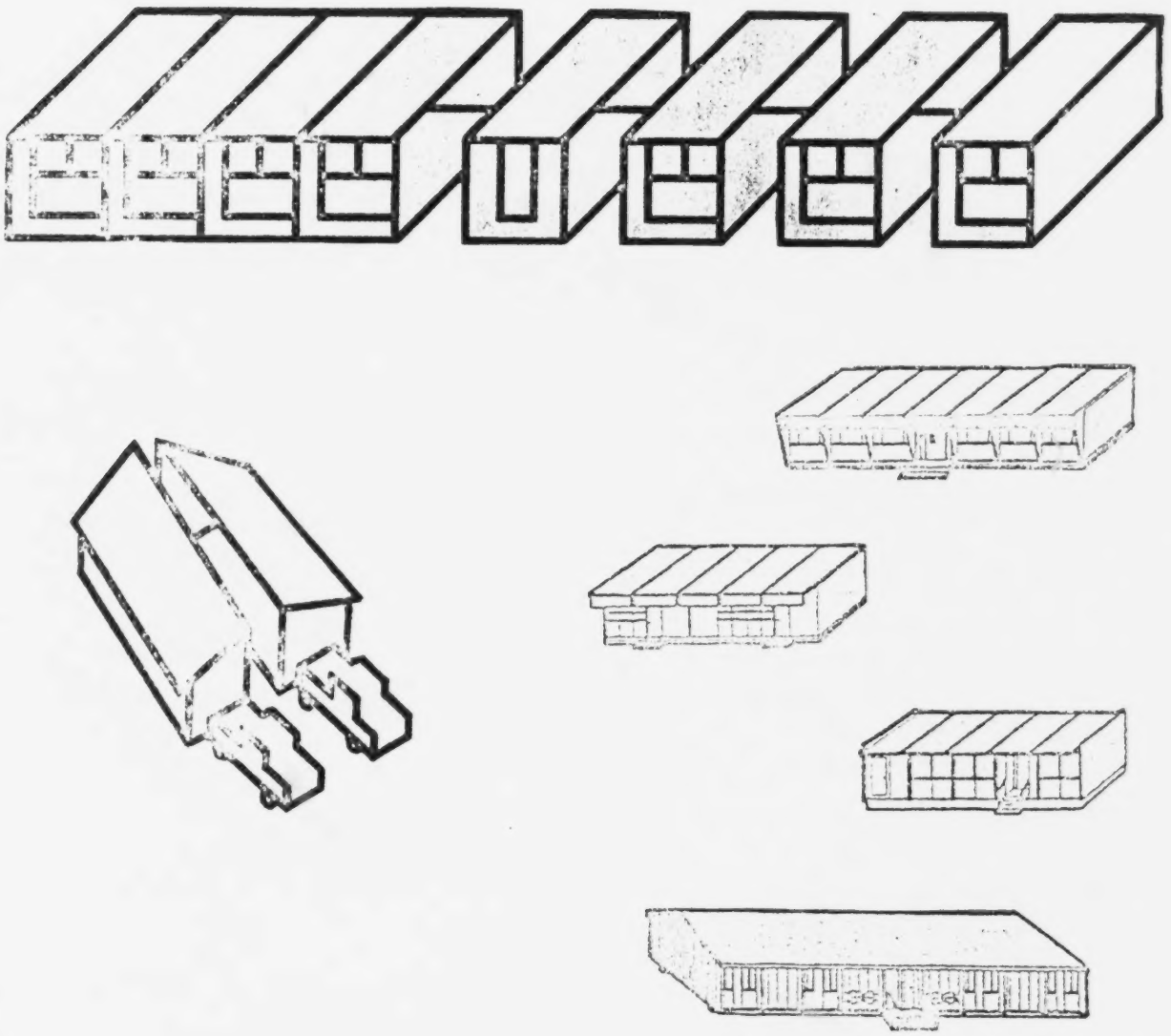
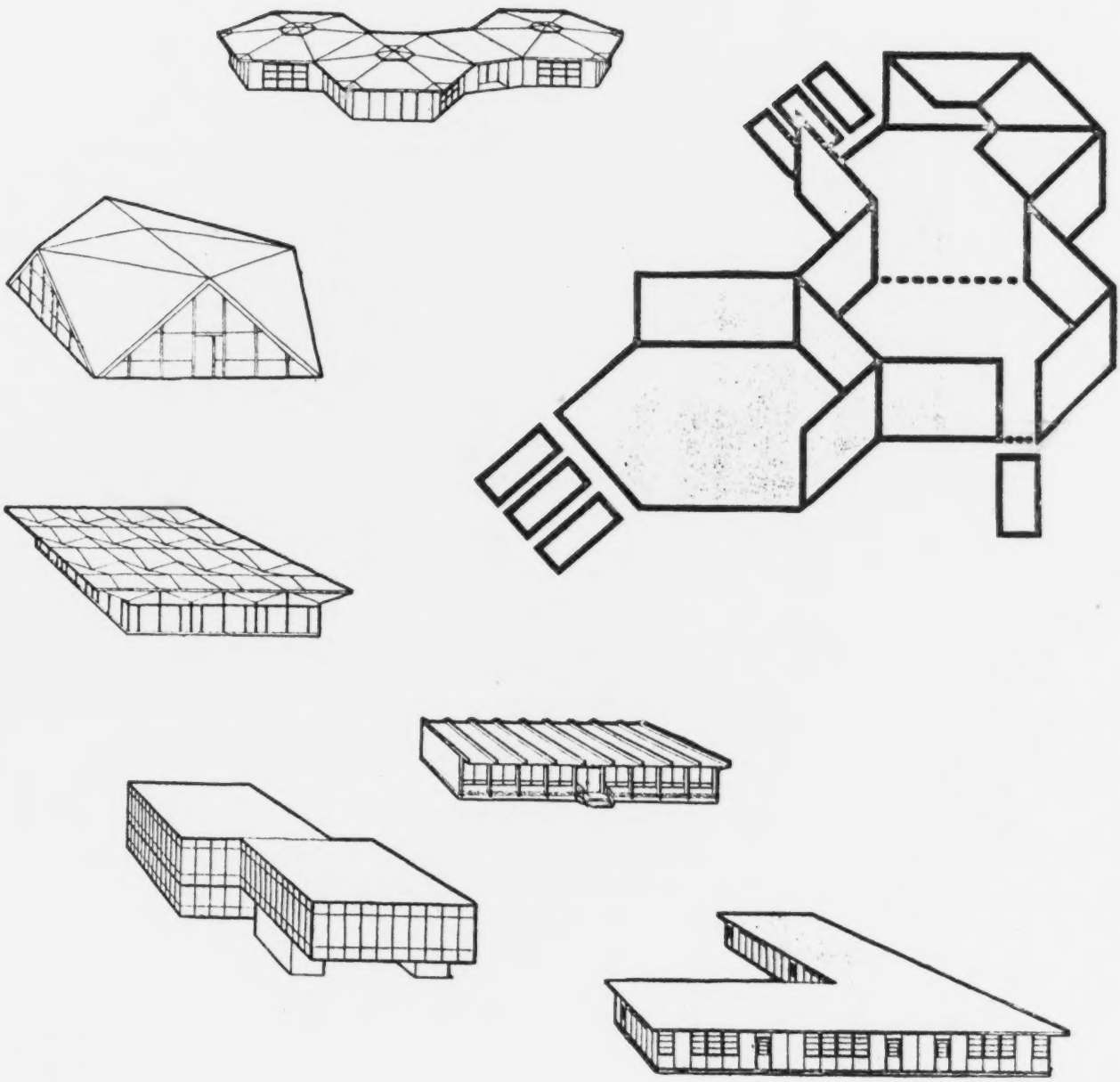


Figure 6 - 4

DEMOUNTABLE FACILITIES



Some reactions to relocatable units. There have been some major and minor reactions to the use of relocatable structures. A survey conducted by the Educational Facilities Laboratories, Inc., of New York reports that the majority of districts using any of the facilities have reported that their relocatable units do not reach the functional, cost, or aesthetic qualities to meet their goals. The costs also are generally higher than anticipated.

A question or two might be asked in relation to the need for relocatability. Why should the units be relocatable? Is the rationale based on shifting enrollments, rapidly growing districts, or on an apparently cheaper solution for a financial squeeze?

It was inevitable that schools should turn to the use of relocatable structures to meet the needs of growing and shifting school enrollments. The concept of planning parts or wholes of a school complex for potential mobility from one site to another is reasonable and practicable. But one might ask another question, Is mobility itself the most important factor--or does the concept of "instant space" overshadow it in importance?

Relocatable suppliers to date are dealing in a commodity. This commodity is designed from a set of standards that is not always adaptable to an individual program. To determine whether a relocatable building is adaptable to local needs, it should be considered against the district's broad educational goals.

Cost Estimates

Initial Costs

If a district decides to follow the space allotment suggested by the state of Oregon (1200 square feet), the cost of relocatable housing is

in the neighborhood of $16,464 per classroom. If, however, one follows a median line and its suggestion of 900 square feet per room, the cost will be in the neighborhood of $12,348 per classroom.

The cost of a relocatable room ranges from $13.72 per square foot up to $18.00 or $20.00 per square foot. Various local suppliers were consulted. Mr. Richard Leaver, who handles most of the modular classroom sales in the state of Oregon, gave a firm cost figure of $13.72 per square foot. The $13.72 figure, according to Leaver, is a "turn-key figure" (meaning the school district is given a key to the building and it becomes school property). This includes the foundation, carpeted and/or vinyl floors, tackable wall surfaces, natural cedar paneling on end walls, and 100-foot candle fluorescent lighting on an acoustical ceiling. Also included are a complete and self-contained ducted electric heating and air-conditioning system, a porch entry, toilet, and some plumbing. As was mentioned before, hook-ups of various natures, walks, and landscaping, are additional costs that the district must bear.

All of the units mentioned are available from one company or another; however, the type most commonly found in this area (and those handled by Bohemia Lumber Company) are of the portable nature.

Teacher Salaries

Jean Spaulding, of the Oregon Board of Education, states that the salary of kindergarten teachers during the 1971-72 school year ranged from $6,600 to $10,980 per year. However, the salary for the 1972-73 school year may increase roughly 5 percent and a reasonable salary estimate, according to Miss Spaulding, would be $9,000. The present average salary of elementary teachers in Oregon is $9,350.

Per Pupil Costs

Miss Spaulding states a per-pupil cost figure of $1.66 to $2.10, which is based on half-day sessions, since most of the kindergartens in the state of Oregon operate on half-day schedules. If the upper limit of the range ($2.10) is used and spread out over 175 days, the average school year, the result is a figure of $367.50 per year per child. (If the lower figure of $1.66 per child is used, the estimate is $290.50 per child per year.)

Cost of Equipment

The cost of equipping a half-day kindergarten (a good one), is estimated as $2,000 to $2,600, which includes indoor equipment (tables, chairs, blocks, housekeeping, creative arts, science, picture and story books, and miscellaneous--$1,500 to $1,800). The aforementioned figure also includes outdoor equipment ($500 to $800). The average cost would be in the neighborhood of $2,000.[9]

Tables 6 - 1, 6 - 2, 6 - 3, and 6 - 4 provide cost estimates (high and low) for establishing a kindergarten program in the North Clackamas School District. Table 6 - 1 shows the estimates of three alternates for facilities as described in this section--temporary housing, new, permanent construction, and relocatable units. Included are construction costs (except for existing facilities), equipment, salaries, supplies, and totals. Basis of the estimates is a class size of 50 children--25 in the morning and 25 in the afternoon.

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[9] Equipment for Children in Kindergarten, N.Y. State Education Department, Albany, N.Y., 1960, pp. 48, 68, 69, 72, 73, 74.

Table 6 - 1

COST PER UNIT[a]--KINDERGARTEN
(All day, 50 students--25 Morning and 25 Afternoon)

	Existing Facilities		New Permanent Constr.[b]		New Relocatable Housing[c]	
	Low	High	Low	High	Low	High
			900 sq. ft.	1200 sq. ft.	900 sq. ft.	1200 sq. ft.
Classroom	--	--	($20/sq. ft.) $900	($20/sq. ft.) $1,200	$1,235	$1,646
Equipment	$2,000	$2,600	$2,000	$2,600	$2,000	$2,600
Teacher's Salary	$7,000	$11,000	$7,000	$11,000	$7,000	$11,000
Teacher Supplies[d]	($1.66 x 177 x 50) $14,691	($2.10 x 177 x 50) $18,585	($1.66 x 177 x 50) $14,691	($2.10 x 177 x 50) $18,585	($1.66 x 177 x 50) $14,691	($2.10 x 177 x 50) $18,585
Total	$23,691	$32,185	$24,591	$33,385	$24,926	$33,831
Est. Cost Per Pupil/ Year	$474	$644	$492	$668	$499	$677
Est. Cost: Classrm. Per Yr. Per Pupil	--	--	$18	$24	$25	$33

[a] Based on study by Paul Abramson, Ed. Fac. Lab., September 1970. Schools for Early Childhood; Profiles of Significant Schools.

[b] Amortized over a 20-year period

[c] Amortized over a 10-year period

[d] $1.66 and $2.10 represent low and high estimated daily cost per pupil.
177 represents the number of school days; 50 represents the number of children.

Table 6 - 2

ESTIMATED OPERATING COSTS FOR 1000 STUDENTS AND
20 TEACHERS--KINDERGARTEN
(TOTAL NEEDS)

	Low Estimate	High Estimate
Teacher Supplies (year)	($1.66 x 1000 x 177) $293,820	($2.10 x 1000 x 177) $371,700
Teachers' Salary	($9,350 x 20) $187,000	($9,350 x 20) $187,000
Fixed Charges (12%)	$22,440	$22,440
Totals	$403,260	$581,140

Table 6 - 3

ESTIMATED CAPITAL OUTLAY COSTS
FOR 20 ROOMS AND EQUIPMENT--KINDERGARTEN
(TOTAL NEEDS)

	New Permanent Construction		Relocatable Facilities	
	900 sq. ft.	1200 sq. ft.	900 sq. ft.	1200 sq. ft.
Cost of One Room	$ 18,000	$ 24,000	$ 12,348	$ 16,464
Cost of 20 Rooms	$360,000	$480,000	$246,960	$329,280
Cost of Equipment (20 x $2,000)	$ 40,000	$ 40,000	$ 40,000	$ 40,000
	$400,000	$520,000	$286,960	$369,280

Table 6 - 2 shows the estimated operational cost of 1,000 pupils and 20 kindergarten teachers--the estimated number represented in the entire North Clackamas district. Table 6 - 3 presents the estimated capital outlay for 20 rooms and equipment--new construction and relocatable units.

Table 6 - 4 shows the cost comparisons of moving the relocatable units from place to place.

These figures are estimates and are subject to change as costs rise.

There are some additional costs that will be absorbed in the total school budget; nevertheless, awareness of them is necessary. The costs include busing, if used, services of speech teacher, school nurse, music, art, and physical education consultants for support of the teacher, as well as teacher aide or aides.

It also may be of interest to look at an estimated cost of relocating three different structures of the relocatable type. The figures in Table 6 - 4 are based only on what such moves have cost in the past.

Table 6 - 4

COST COMPARISONS FOR RELOCATING FACILITIES

	Mobile	Divisible Mobile	Demountable
Foundation Costs	$ 185	$ 382	$ 935
Utility Hookups, Electricity Only	445	122	226
Dismantle and Erect	---	224	610
Walks, Steps, etc.	100	115	275
Transport Cost	240	416	105
Total Estimate to Relocate	$ 970	$1,259	$2,151

SECTION 7

A MASTER PLAN: 1972-92

Introduction

This section of the report brings together data generated in previous sections, analyzes the data, and outlines a long-range plan for facility usage and construction needs. It should be modified on an annual or bi-annual basis as current projections are monitored and confirmed or altered.

In addition to the projections regarding population and facility needs, the proposed plan is based on certain assumptions regarding a desired vertical grade organization and school size. Information related to these assumptions was presented in Sections 2 and 3. This information suggests that K-5, 6-8, 9-12 grade organization would best meet the needs of the North Clackamas School District. It also suggests that the optimum size for schools would be: elementary, 400-600; middle school or junior high, 600-800; and senior high, 1200-1400.

Given these assumptions and projections concerning size and location of the student population, the study team has developed a master plan for the North Clackamas School District that it considers feasible and educationally sound. The master plan should not be accepted as the final word in planning for the next twenty years, but rather as a working document, a set of guidelines, to provide direction as the North Clackamas community, board of education, administration, staff, and students develop and implement a dynamic education program for the 1970's and 1980's.

The remainder of this section will be addressed to the projected student population growth, current building capacity of the district, adequacy of current buildings, construction needs, related financial factors, and recommendations for updating the master plan.

Student Population Growth

There are two major concerns regarding the student population of the district that must be considered by the educational planner: (1) How many students must the district serve? (2) Where will the students be located within the district?

Using current enrollment data, census data and appropriate projection techniques as described in Sections 1 and 4, the study team examined the anticipated growth in student population in the North Clackamas School District. Current projections (see Figure 7 - 1) suggest that the total student population will increase by approximately 10 percent by 1982 and by 50 percent by 1992.

Further examination of the projected student enrollment by level suggests that most, if not all, of the anticipated increase prior to 1982 will occur at the elementary (K-5) level.

Figure 7 - 2 indicates that the K-5 enrollment will increase by more than 1,500 students, whereas the 6-8 and 9-12 enrollment will remain relatively stable. All three levels show a steady growth during the 1982-92 period.

In terms of location, the greatest increase in student population will be in the eastern portion of the district. For analytical purposes, the study team has divided the district into three areas: west, central, and east. (See Figure 7 - 3)

Figure 7 - 1

TOTAL ENROLLMENT - 1972-1992
NORTH CLACKAMAS SCHOOL DISTRICT

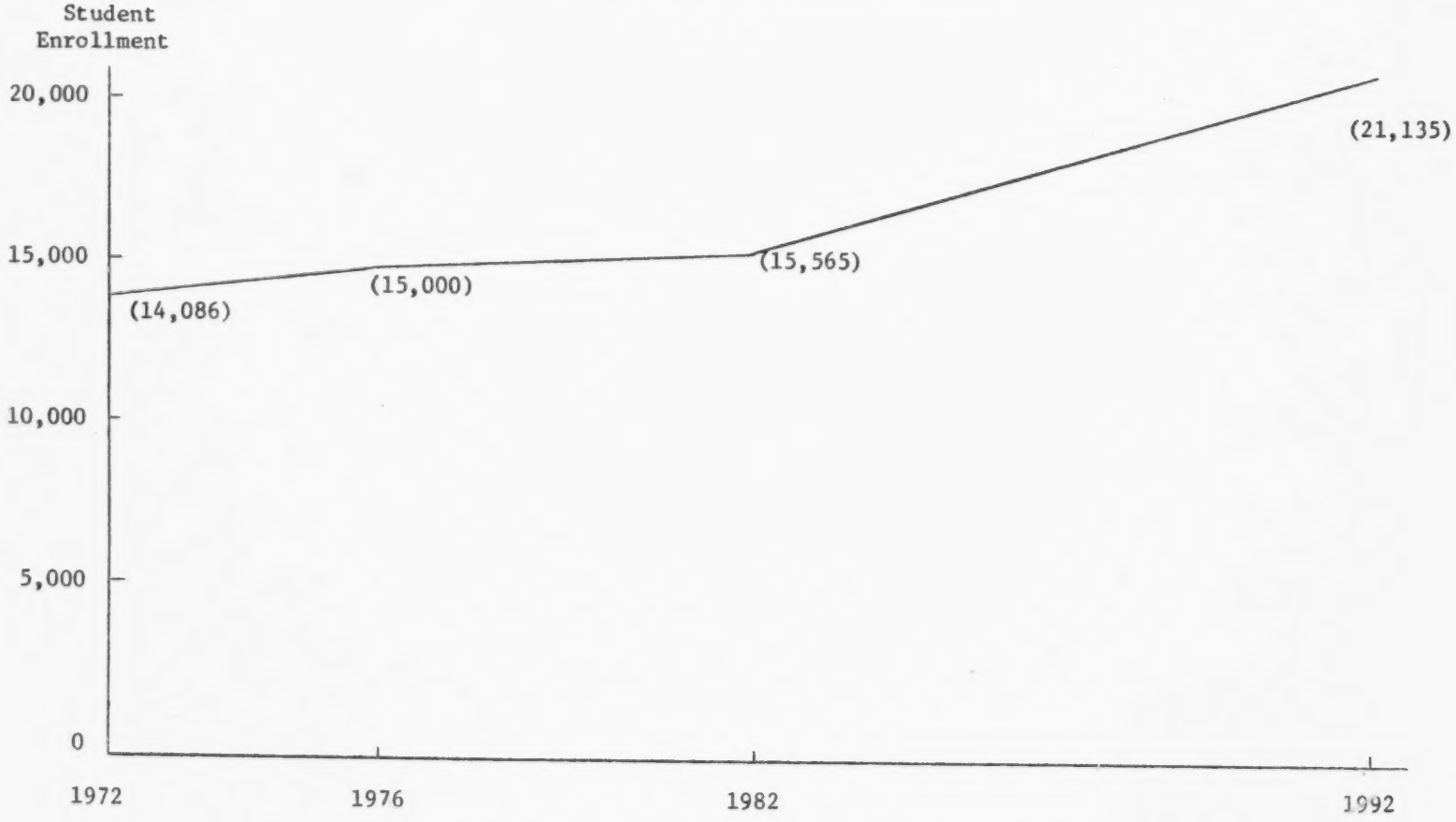


Figure 7 - 2

ENROLLMENT BY GRADE ORGANIZATION - 1972-92
NORTH CLACKAMAS SCHOOL DISTRICT

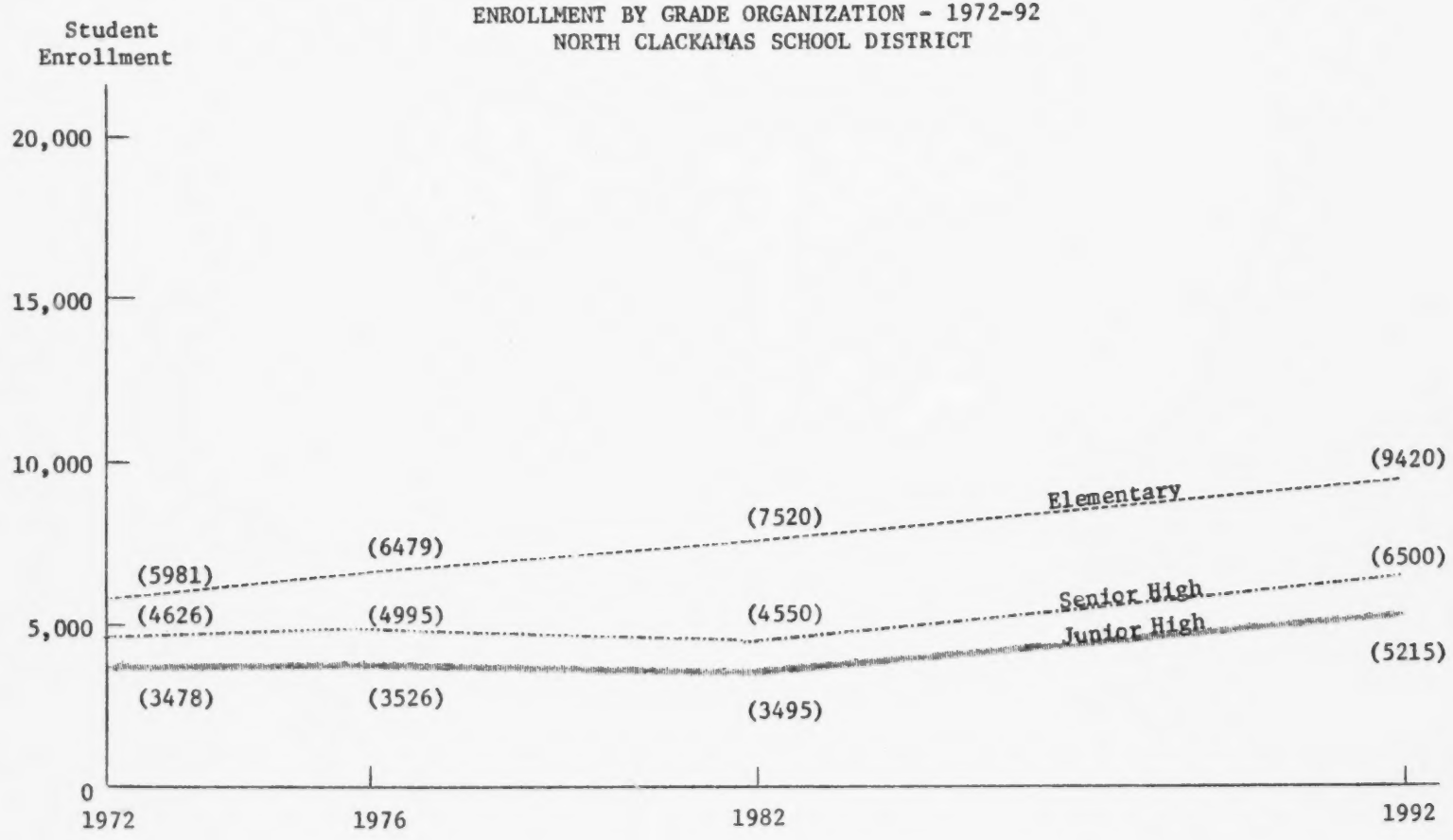
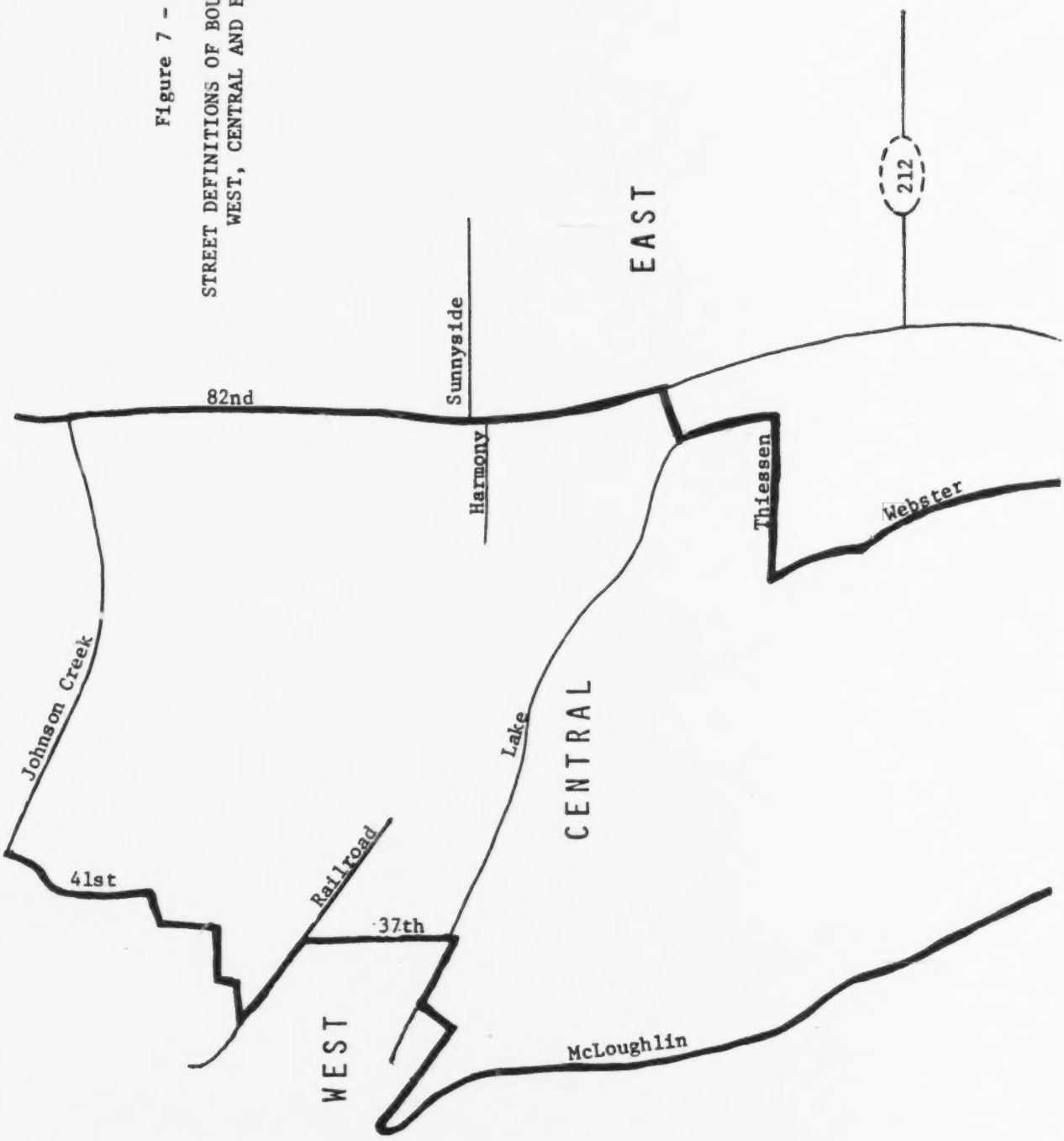


Figure 7 - 3

STREET DEFINITIONS OF BOUNDARIES BETWEEN
WEST, CENTRAL AND EAST AREAS



Comparison of the total student population, in each of these areas, shows that although all areas will have more students by 1992, the proportion of students residing in the eastern portion of the district will increase substantially over the next twenty years. Table 7 - 1 shows this eastern shift of the total student population.

Table 7 - 1

LOCATION OF TOTAL STUDENT POPULATION

	West		Central		East	
	N	%	N	%	N	%
1972	3,662	26	6,762	48	3,662	26
1982	3,269	21	7,472	48	4,824	31
1992	4,015	19	9,793	46	7,397	35

Allowing for this anticipated eastward shift of the student population, it is possible to project the student attendance by level for each of the three areas.

Table 7 - 2

LOCATION OF STUDENT POPULATION BY LEVEL

	West			Central			East		
	K-5	6-8	9-12	K-5	6-8	9-12	K-5	6-8	9-12
1972	1,555	904	1,203	2,871	1,670	2,221	1,555	904	1,203
1982	1,579	734	956	3,610	1,678	2,184	2,331	1,083	1,410
1992	1,790	991	1,235	4,333	2,399	2,990	3,297	1,825	2,275

Practical Capacity of Current Buildings

Having established the anticipated growth of the student population in North Clackamas School District, it is now necessary to examine the current capacity of the district to house students. Table 7 - 3 presents capacity data generated in Section 1.

Table 7 - 3

PRACTICAL CAPACITY OF CURRENT BUILDINGS

Level	Student Capacity
Elementary (K-5)	6,752
Junior High (6-8)	2,695
Senior High (9-12)	4,450*
Total	13,897

*Includes 300 student spaces at the Occupational Skills Center.

The practical capacity figure for grades 9-12 includes the 300 students attending the Occupational Skills Center. This is slightly misleading in that, while the location of the center does reduce the classroom space required at the other senior high schools, it does not decrease space needs in the support areas such as lockers, dressing rooms, counseling, cafeteria, etc.

Figures 7 - 4, 7 - 5, and 7 - 6 illustrate the comparison of anticipated student population growth and the district capacity to house students by level. It is apparent that the most immediate housing problems are at the middle school (junior high--6-8) level.

Table 7 - 4 presents the anticipated space shortage in total numbers of students by level in 1972, 1976, 1982, and 1992.

Figure 7 - 4

ELEMENTARY (K-5) SCHOOL ENROLLMENT - 1972-92
NORTH CLACKAMAS SCHOOL DISTRICT

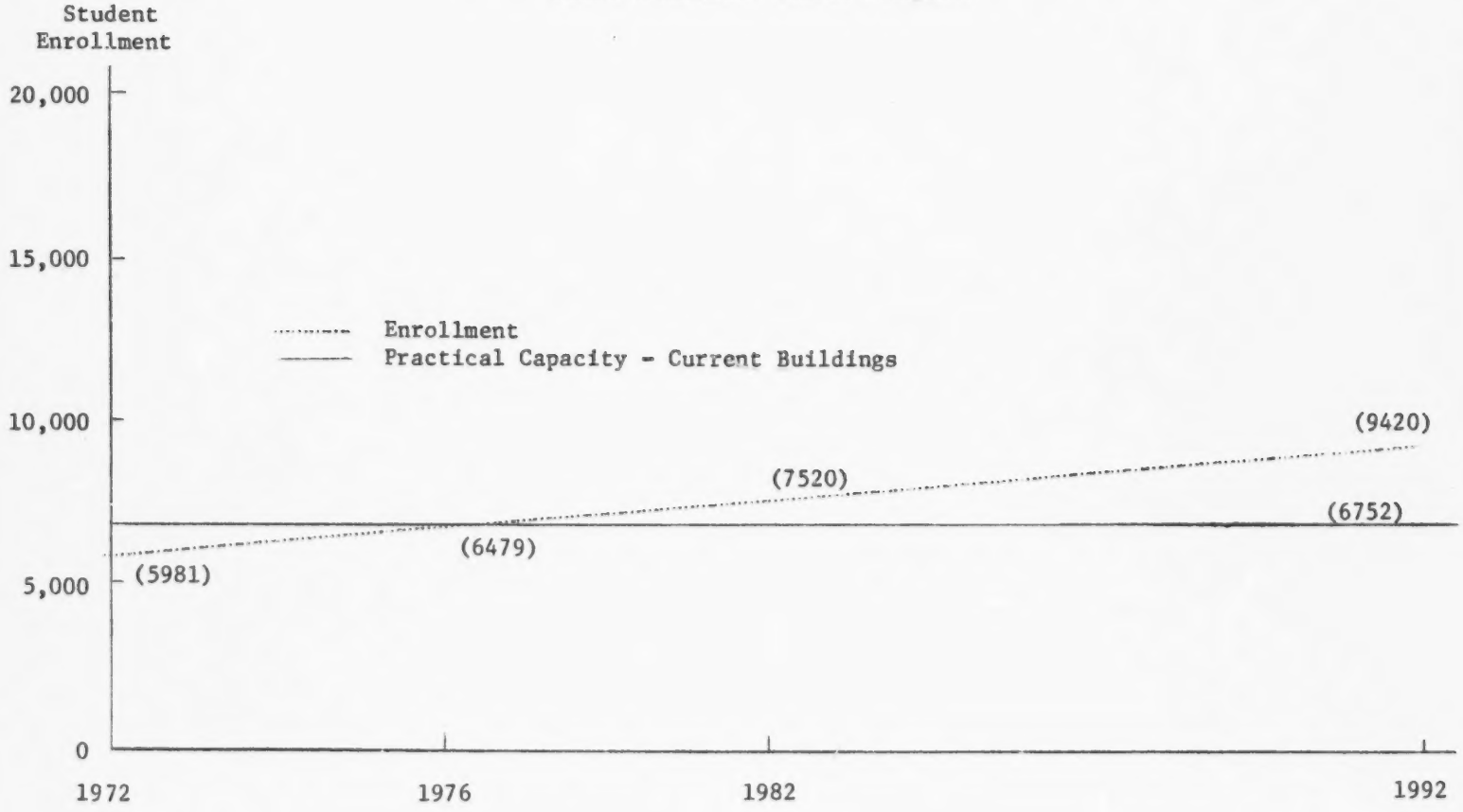


Figure 7 - 5

JUNIOR HIGH (6-8) SCHOOL ENROLLMENT - 1972-92
NORTH CLACKAMAS SCHOOL DISTRICT

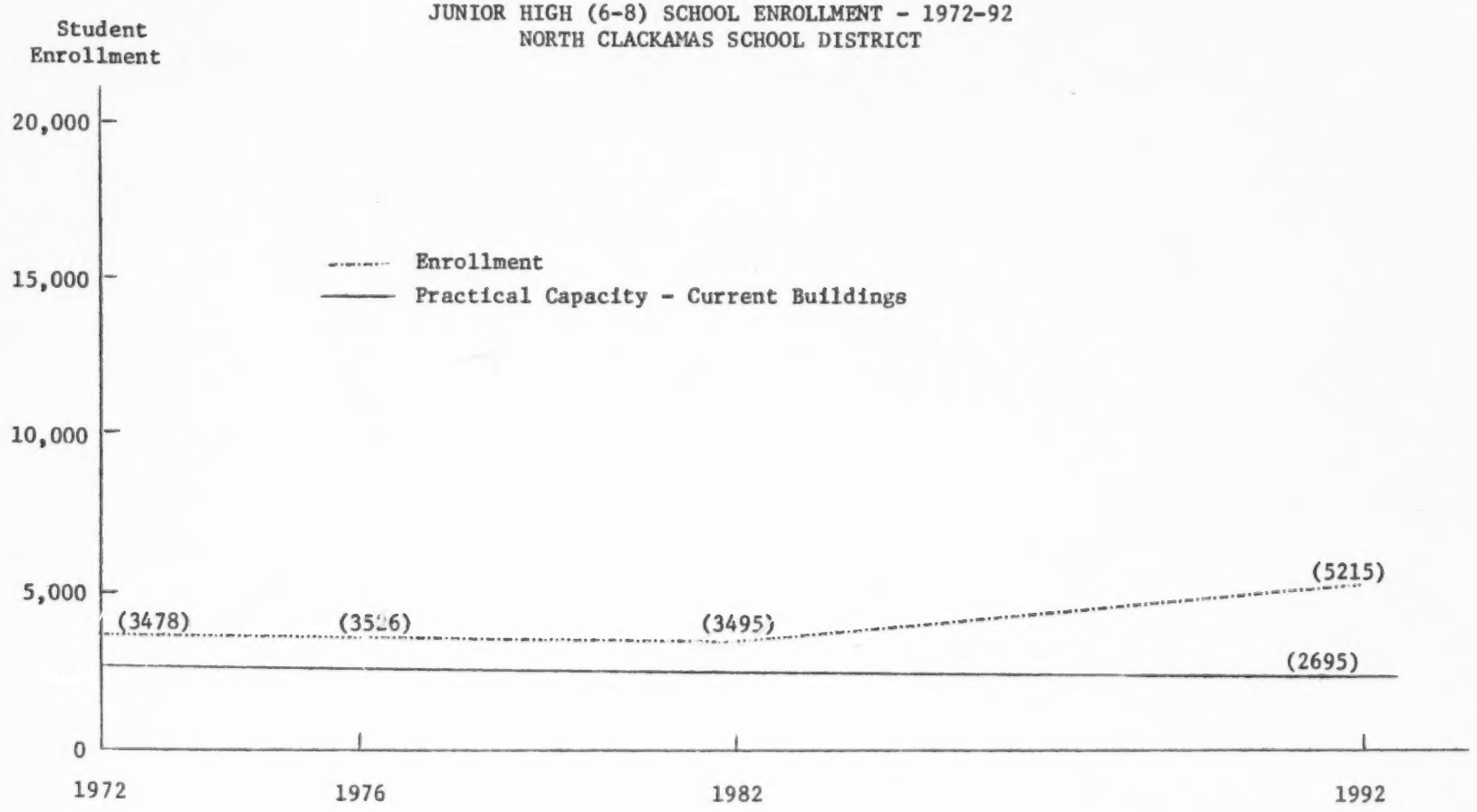


Figure 7 - 6

SENIOR HIGH (9-12) SCHOOL ENROLLMENT - 1972-92
NORTH CLACKAMAS SCHOOL DISTRICT

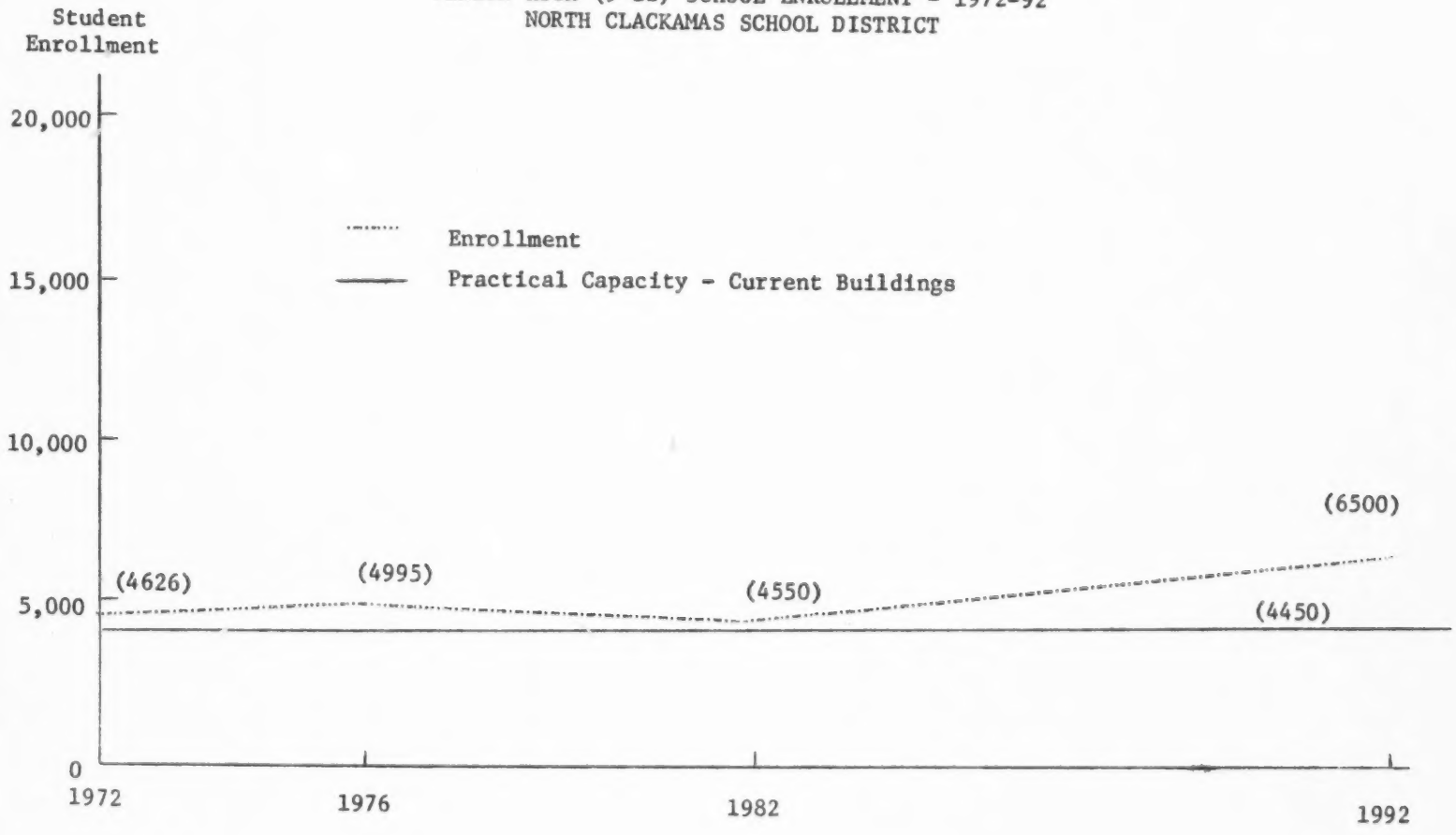


Table 7 - 4

PROJECTED STUDENT SPACE SHORTAGE USING CURRENT BUILDINGS

	K-5	6-8	9-12
1972		783	177
1976		831	545
1982	768	800	100
1992	2,668	2,520	2,050

Adequacy of Current Buildings

In addition to meeting the housing needs of a growing student population, and moving to the K-5, 6-8, 9-12 grade organization, the district must also address itself to the adequacy of current educational facilities. In Sections 4 and 5 of this report the study team has suggested that certain existing facilities are marginal and should be replaced as soon as possible. The team has also suggested that certain existing sites are suitable for enlarging.

Present facilities which are considered marginal include Carver School, Milwaukie Junior High, the original building at Oak Grove, Clackamas Elementary School, and the original building at Milwaukie Grammar School. These structures should be replaced as soon as possible.

The sites which seem suitable for additional construction are Sunnyside, Bilquist, Linwood, Happy Valley, and North Oak Grove. The addition of classroom space in each facility presumes that an appropriate addition of support facilities will be made.

Construction Needs

In determining the construction needs of the North Clackamas School District for the next twenty years, the study team has carefully considered the condition of existing facilities, anticipated student population increases, and the anticipated location of the student increase.

Consideration has also been given to the desired size of the schools and the move to a K-5, 6-8, 9-12 grade organization. However, the transition to the new grade organization probably had better take place on a gradual basis; for example, include some sixth-grade classes at Rowe and Ickes Junior High Schools to allow for adding kindergarten programs at appropriate elementary schools. With the recommended addition of relocatable classrooms at McLoughlin Junior High, it would also be possible to move immediately toward a 6-8 program on that site.

Given the above constraints and goals, the study team suggests the following schedule of construction activities for the North Clackamas School District during the 1972-1982 period:

Recommended 1972-76 Construction Activities

Elementary Schools

Phase out Carver School.
Add 8 rooms to Sunnyside.
Add 7 rooms to Bilquist.
Add 4 classrooms to Linwood.
Add 4 classrooms to Lewelling.
Add 4 classrooms to North Oak Grove.
Phase out old building at Oak Grove.

Junior High Schools

Build junior high school in east.
Build junior high school in southwest.
Add relocatable classrooms at McLoughlin.
Phase out Milwaukie Junior High.
Convert Concord Junior High to an elementary school.

Senior High Schools

Use relocatable classrooms as required.
Consider expansion of Occupational Skills Center.

General

Evaluate existing property and secure new sites in central and east as prerequisite for building needs in 1982-92 period.

Recommended 1976-82 Construction Activities

Elementary Schools

Build new elementary school in southeast.
Add 4 classrooms at Happy Valley.
Add 4 classrooms at North Oak Grove.
Phase out Clackamas Elementary.
Phase out original Milwaukie Grammar building.
Add required support facilities for K-3 program in new wing at Milwaukie Grammar.
Add 4 to 8 classrooms at Linwood as needed.

Junior High Schools

No construction anticipated.

Senior High Schools

Continue to use relocatable classrooms.

The proposed schedule of construction activities is designed to remove marginal facilities and provide adequate housing for the students in the North Clackamas School District. Comparing the anticipated 1982 student enrollment by level and geographical area with the building capacity generated by the proposed construction reveals that all students will be adequately housed at that time. Table 7 - 5 and Figures 7 - 7 and 7 - 8 compare the 1982 projected enrollment and building capacity of the district.

Table 7 - 5

1982 ELEMENTARY ENROLLMENT AND BUILDING CAPACITY

Area	Enrollment	Capacity
West	1,579	1,545
Central	3,610	3,590
East	2,331	2,330
Total	7,520	7,465

Note that the building capacity figures for the three senior high schools (Figure 7 - 8) are slightly higher than the figures recommended in this report (see Sections 4 and 5). The increased capacity results from the study team's recommendation that relocatable classrooms be used at each high school site until the total enrollment increase justifies the construction of a fourth high school facility.

Given the current enrollment projection, the North Clackamas School District will need to construct the following buildings during the 1982-92 period:

Three elementary schools
Two junior high schools
Two senior high schools

The location and precise opening date for these buildings will have to be determined at a later time by district planners as they monitor the growth within the district. However, if there is a constant rate of growth during this period, it would appear that the new buildings will need to be opened on the following schedule:

Elementary schools	1984, 1987, and 1989
Junior high schools	1985 and 1989
Senior high schools	1985 and 1990

To replace marginal facilities and provide adequate space for the anticipated student population growth, the study team has proposed the construction

Table 7 - 6

PROPOSED NEW CONSTRUCTION BY TIME PERIOD

	K-5		6-8	9-12	Total	
Period	Classrooms*	Buildings	Buildings	Buildings	Classrooms	Buildings
1972-76	23	-	2	-	23	2
1976-82	12-16	1	-	-	12-16	1
1982-92	-	3	2	2	-	7
Total	35-39	4	4	2	35-39	10

*The addition of classrooms to various elementary sites presumes an appropriate addition of support facilities on the site.

Figure 7 - 7

1982 BUILDING CAPACITY AND PROJECTED
JUNIOR HIGH SCHOOL (6-8) ENROLLMENT

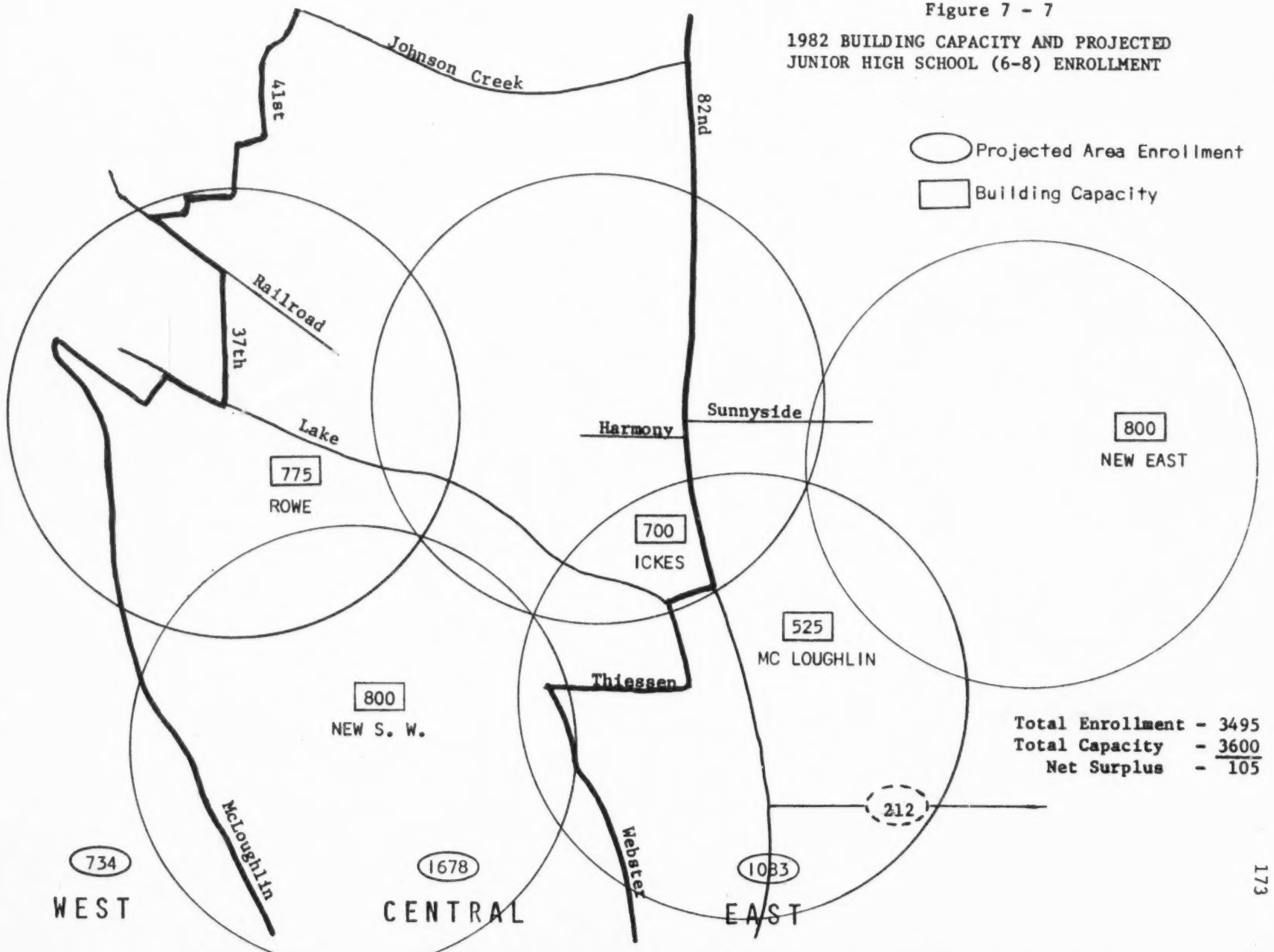
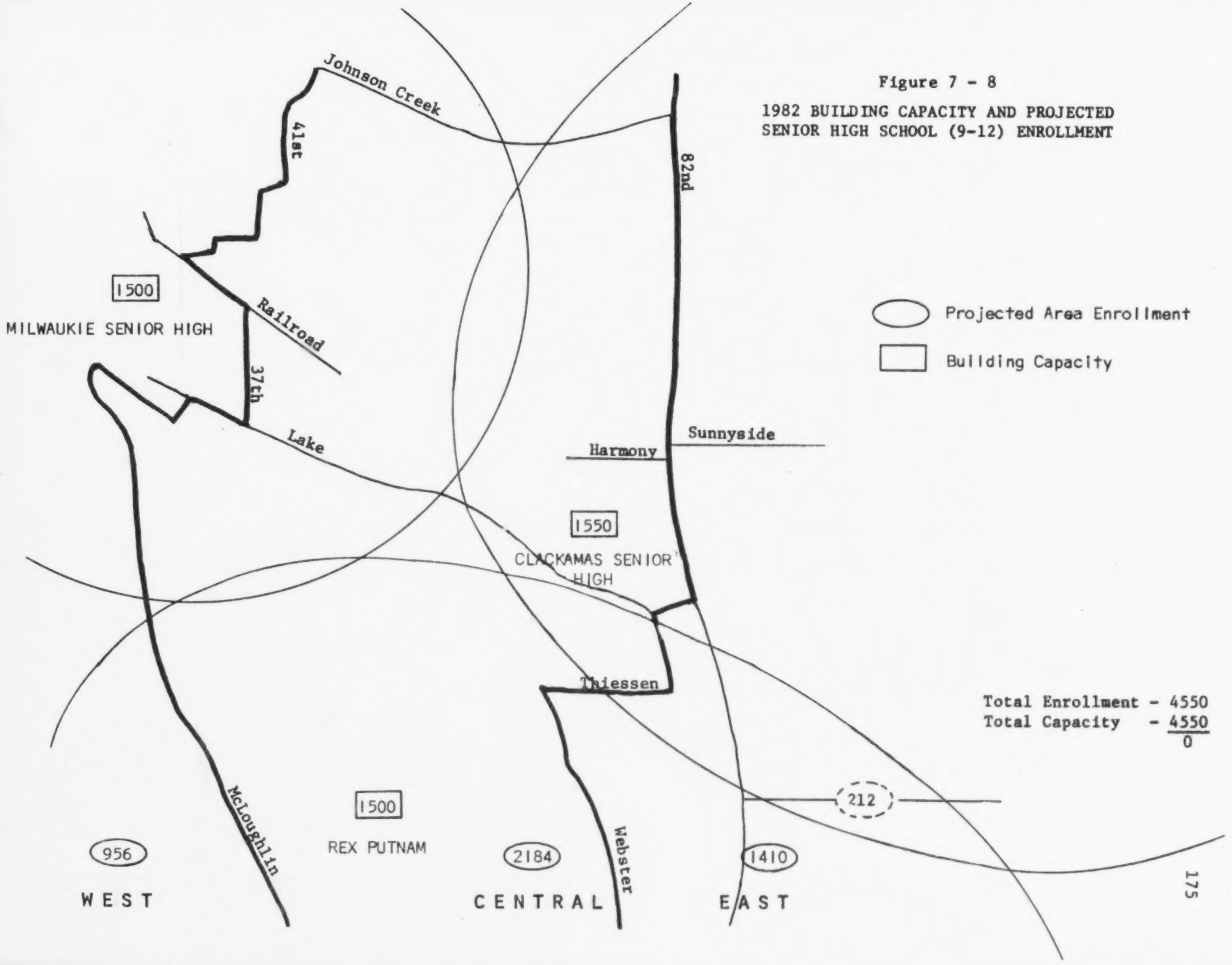


Figure 7 - 8

1982 BUILDING CAPACITY AND PROJECTED
SENIOR HIGH SCHOOL (9-12) ENROLLMENT



of ten new buildings and 35 to 39 additional classrooms in the North Clackamas School District during the next twenty years. Table 7 - 6 summarizes the proposed construction by time period.

Construction of new buildings requires advance planning to assure that buildings will be available when there are sufficient students to open the new facility. Table 7 - 7 is offered as a guide for developing a time line for a new building project.

Table 7 - 7

BUILDING PROJECT TIME LINE

	Need Established ----- Building Opening
Elementary	25 - 33 Months
Junior High School	28 - 38 Months
Senior High School	38 - 50 Months

Major Steps

1. Establish need
2. Select and acquire site
3. Financing
4. Educational specifications developed
5. Building design
6. Bid
7. Building construction
8. Building opens

Related Financial Factors

When developing proposed construction schedules, the North Clackamas School District planners will have to consider cost of construction and the

district's ability to finance the desired construction. The study team has collected and analyzed data related to these issues. Tables 7 - 8 and 7 - 9 summarize this information.

Table 7 - 8

PROJECTED BUILDING PROJECT COSTS*

Year	Elementary (K-5) 550 Students 55,000 Square Feet	Junior High (6-8) 805 Students 86,600 Square Feet	Senior High (9-12) 1,500 Students 200,500 Square Feet
1972	$1,717,400	$ 3,085,864	$ 5,943,320
1976	2,380,073	4,276,569	8,236,600
1982	3,882,796	6,977,081	12,535,683
1986	5,381,004	9,669,246	17,372,684
1992	8,779,427	14,539,223	28,342,966

*Building project costs include:

a) Building construction
b) Fixed equipment
c) Movable equipment
d) Site work and utilities
e) Services and fees
f) Design and cost contingencies

Table 7 - 9

NORTH CLACKAMAS SCHOOL DISTRICT #12
PROJECTED ASSESSED EVALUATION AND BONDING CAPACITY

	Assessed Evaluation[a]	District Bonding Capacity[b]
1971-72	$ 453.694,996	$ 33,573,429
1975-76	666,597,013	49,328,178
1981-82	979,449,713	72,479,278
1985-86	1,332,530,520	98,607,258
1991-92	2,120,144,074	156,890,661

[a]Assessed evaluation computed @ 8% increase per year.
[b]Bonding capacity computed @ 7.4% of assessed evaluation.

Table 7 - 10

PROPOSED NEW BUILDING COSTS VS.
PROJECTED BONDING CAPACITY

	New Construction Costs	Total to Date	Bonding Capacity
1972	$ 8,553,138	$ 8,553,138	$ 49,328,178
1982	3,882,796	12,435,934	72,479,278
1992	112,102,647	124,538,581	156,890,661

NOTES: 1) New construction costs do not include cost of classrooms added to existing structures.
2) Figures do not reflect a repayment schedule.
3) Construction costs were computed at the rate of the projected costs for the last year during the period of construction.

Updating the Master Plan

The proposed twenty-year plan for construction of facilities is based on an analysis of data related to the projected number and location of students in the North Clackamas School District as well as an analysis of the adequacy of existing facilities.

Specific recommendations were made for the periods 1972-76 and 1976-82, whereas more general recommendations were made for the 1982-92 period.

To update this plan will require systematic gathering of census and enrollment data on an annual or biannual basis (this activity has been recommended in Sections 4 and 5). As these data are gathered, they should be compared with the projections on which the current plan is based. If discrepancies in location and/or number of students become significant, appropriate adjustments will have to be made and modified projections generated. If the projections remain accurate, adjustments will not be necessary.

It is recommended that the Clackamas County Planning Office, Columbia Region Association of Governments (CRAG), U. S. Census Bureau, and agencies such as the Bureau of Governmental Research and Bureau of Educational Research and Service be contacted for assistance in making new projections periodically (every 2-5 years depending on accuracy) as the district planners look more closely at the 1980's, 1990's, and beyond.

If the district maintains and compiles the enrollment data on a systematic basis as has been recommended, professional agencies such as those listed above should be able to generate revised projections with minimum work and optimum accuracy.